REPORT RESUMES

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PREPARATION OF EDUCATIONAL SPECIFICATIONS.

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FORMULATION OF EDUCATIONAL SPECIFICATIONS IS REPORTED. THE FORMULATION CONSISTS OF ESTABLISHING THE DEFINITION, CONTENT, RESPONSIBILITY AND ROLES OF PLANNERS, THE ORGANIZATION OF THE PLANNING GROUP AND THE TECHNIQUES AND PROCEDURES TO BE USED. A SAMPLE OUTLINE FOR EDUCATIONAL SPECIFICATIONS AND A FORMAT FOR INDIVIDUAL COURSES, TIME REQUIREMENTS AND BUDGETING ARE PRESENTED AS GUIDES. SPECIFICATIONS ARE GIVEN FOR AN ELEMENTARY SCHOOL, A DATA PROCESSING DEPARTMENT AND A JUNIOR-SENIOR HIGH SCHOOL, INCLUDING SITE PLANNING, SPACE UTILIZATION AND MAINTENANCE, AND OPERATION. A BIBLIOGRAPHY IS INCLUDED IN THE STUDY. (GM)

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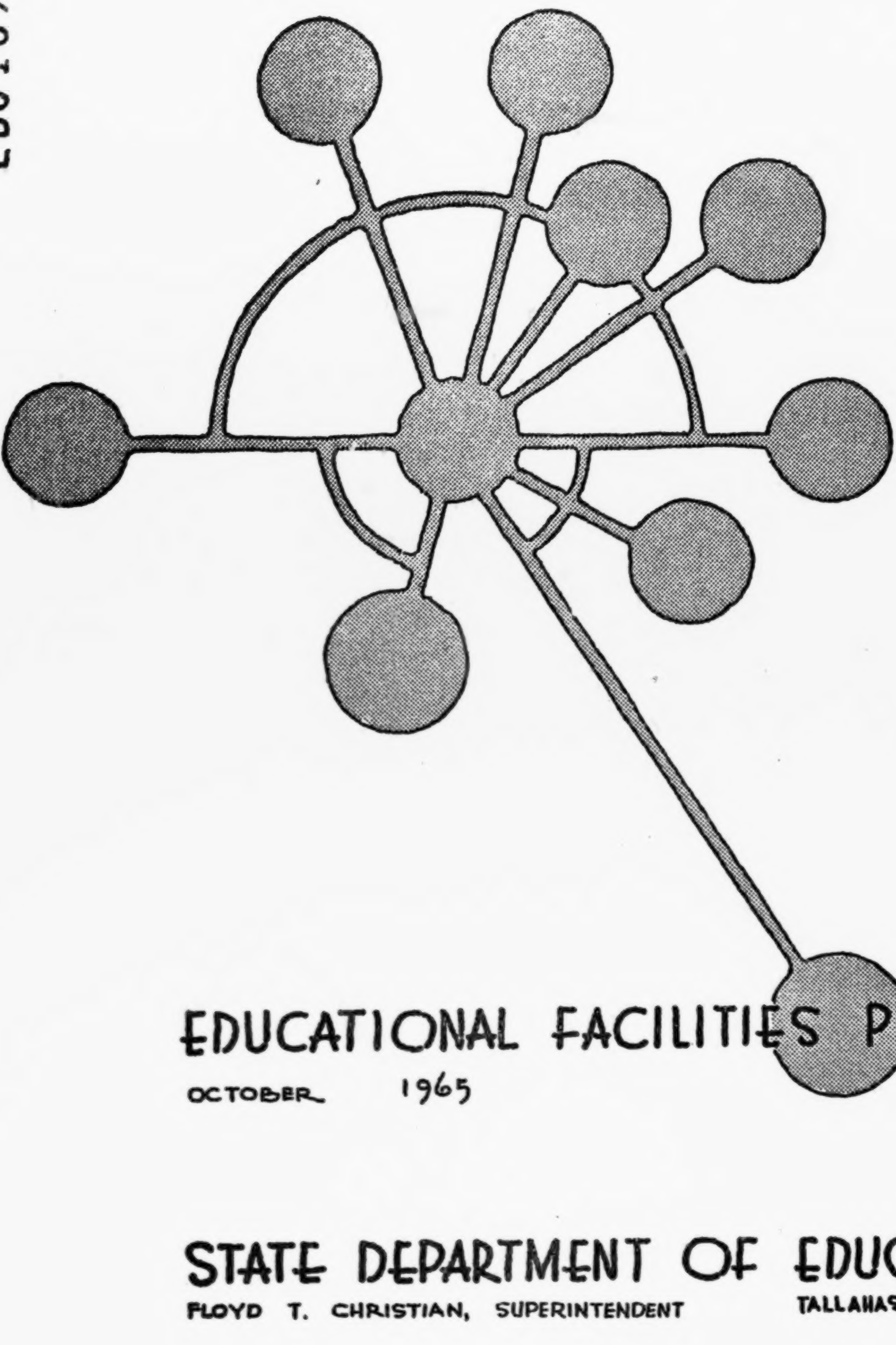

EDUCATIONAL FACILITIES PLANNING

OCTOBER 1965

EF000520

STATE DEPARTMENT OF EDUCATION
FLOYD T. CHRISTIAN, SUPERINTENDENT
TALLAHASSEE, FLORIDA

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION

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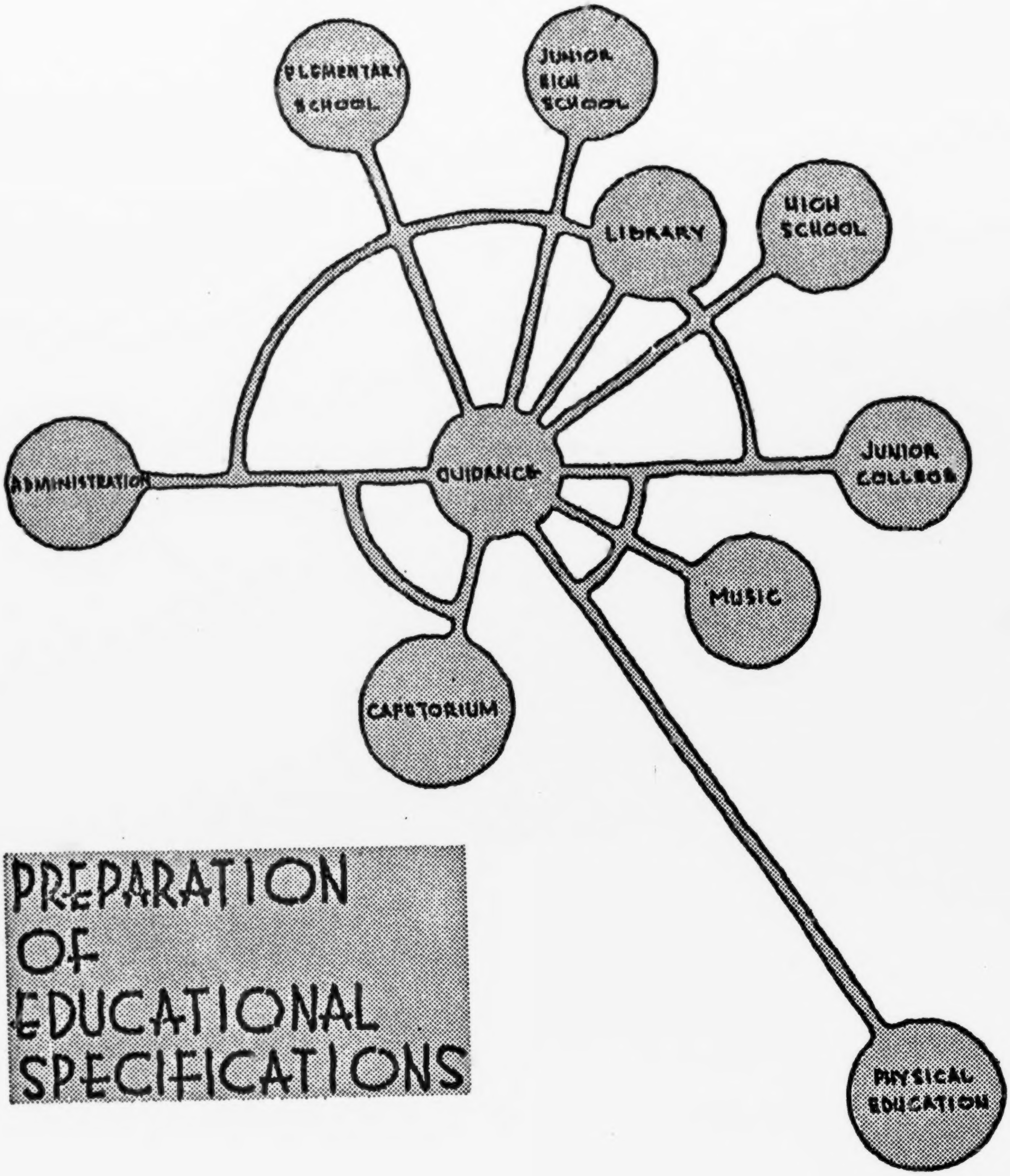
ELEMENTARY SCHOOL
JUNIOR HIGH SCHOOL
LIBRARY
HIGH SCHOOL
ADMINISTRATION
GUIDANCE
JUNIOR COLLEGE
MUSIC
CAFETORIUM
PHYSICAL EDUCATION

PREPARATION OF EDUCATIONAL SPECIFICATIONS

SCHOOL PLANT SECTION STATE DEPARTMENT OF EDUCATON TALLAHASSEE, FLORIDA

FOREWORD

The people of Florida -- educators, parents, architects and state and county officials, have an interest in quality education and its future aims in our state. They are not only interested in education, but are sensitive to its needs, both in money and quality of program offered. The parent's interest is that his child obtain a comparable education to any taught in our country. Well planned facilities are necessary to accomplish this and to prepare for future changes and growth.

In some areas of Florida school enrollment far surpasses all survey predictions, while other areas remain rather constant. In order to provide the facilities and house our pupils adequately, good planning is necessary and must be a continuing process to provide quality education for the growth in all areas.

New curricula, methods of instruction, and teaching aids are adding to the sophistication of education. It is no longer advisable to trust complicated educational planning to informal discussion between the educator and the architect. The programs encompass many areas of education, each requiring professional decisions. These decisions being a result of the action of many people, lay and professional, must be organized into written specifications as a means of communicating these decisions to the architect. This document further communicates the method of operation, to the ultimate classroom teacher and school administrator.

It is my sincere hope that the material contained herein will prove invaluable as a guide in the preparation of educational specifications. My belief is that good planning results in good school plants, which in turn will house the most effective instructional programs and provide the best education possible for the Florida pupil.

Floyd T. Christian

Floyd T. Christian
State Superintendent of Public
Instruction

ACKNOLWEDGMENTS

The material in this guide is the result of a team effort on the part of staff members of the School Plant Section of the Florida State Department of Education. The information was gained from the experience in working with counties and junior colleges in compiling their educational specifications.

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INTRODUCTION

Educational planning for new school facilities is the organization and the preparation of a written statement of the school program to be housed. This is the responsibility of the educator in order to fulfill his role as a professional planner and to determine the direction education should take in fulfilling the purposes set by public policy. Such planning should be under the responsible direction of the educator-planner whose training and experience qualify him for this role.

Without a definite specification of educational needs and requirements, the design solution to the educational problem becomes impractical, expensive, and usually unworkable. In such cases, the architect is at the mercy of the educator, if the educator fails to properly state the problem for which an architectural solution is required.

Quite often there is not sufficient time to do the educational planning required. School facilities are usually permanent and involve a considerable outlay of capital. Can we afford not to take the time necessary, whether a week or a year, to plan facilities which may be used for fifty or more years?

Planning school facilities is a tedious and complicated process. Anyone who has planned a home for a single family knows the work involved to bring all the required functions under one roof. The school family is much larger, and the interdependence of activities is correspondingly more involved than are those for a home. Planning new facilities requires considerable time and detail, but to proceed without great care could be costly in plant and teaching-learning experience.

STATEMENT OF PROBLEM

Education is subject to constant change. Planning a facility to serve both the current educational program and program changes that occur during the lifetime of the facility, is a challenge of the highest order. Careful and creative planning is essential in order to prevent the obsolescence of facilities in the very early stages of their occupancy.

The processes of education, being complicated and subject to continuous modification, are determined to a large extent by what is known about the learner and his method of learning. From these understandings, a curriculum is evolved to implement new and more effective approaches to meet the needs for education. Much remains to be learned in this regard.

Teaching methods, school organization, and the body of knowledge which is available to the learner is subject to constant change. The increased improvement in knowledge and technological developments continues having an influence on instructional methods and school organization. Such change will require constant revision of what is to be taught and how it is to be presented.

The purposes of education are subject to continuous change. Aims and objectives of education develop with values held by our society, and this evolution must be considered if our education is to keep up with these developments. The impact of these changes must be carefully considered in order to keep the instructional program on a par with the latest developments, and the proposed instructional program must be progressive and forward looking if the newly planned facility is to embrace modern curricula.

To keep abreast of such changes is a difficult but vital task. The difficulty is very often increased by the limitation of time. Population increases add to the urgency of the problem which may often create time limits in the planning below that which is adequate.

An instructional staff must continually study and evaluate the research on how learning takes place; knowledge about the learner, teaching methods and curricula materials. The re-thinking of points of view about education and its purposes must be a continuing process. This is necessary for effective teaching and is most important as background for the planning of a new facility to meet the requirements of changing instructional programs.

HISTORICAL DEVELOPMENT

The Curriculum and Facilities

One-Room Schoolhouse

In the early 19th century, the one-room schoolhouse prevailed. Instruction was ungraded and individualized. Small groups of pupils were taught the three R's and moral values, each at his own level and speed. Sometimes the school was conducted in the teacher's home. The program, and in turn the facility, was simple, with little planning necessary. Any place with four walls and a roof served the purpose.

Lancastrian-Monitorial School

The Lancastrian or Monitorial School made its debut in America in 1806. New York City established the first of these schools. Other schools were established as far west as Cincinnati and Detroit, with some operating as early as 1853. Joseph Lancaster, an English Schoolmaster, advanced the idea of using pupils as monitors, hence the system was called Lancastrian or Monitorial.

The principal motive for the development of this method was to provide a means of teaching larger groups more economically. The system took the catechism as a model, and each subject was reduced to a set of questions and answers. The teacher may have drilled a group of 50 head pupils, or monitors, who in turn would drill approximately ten pupils each, thus making it possible for one master to teach 500 pupils.

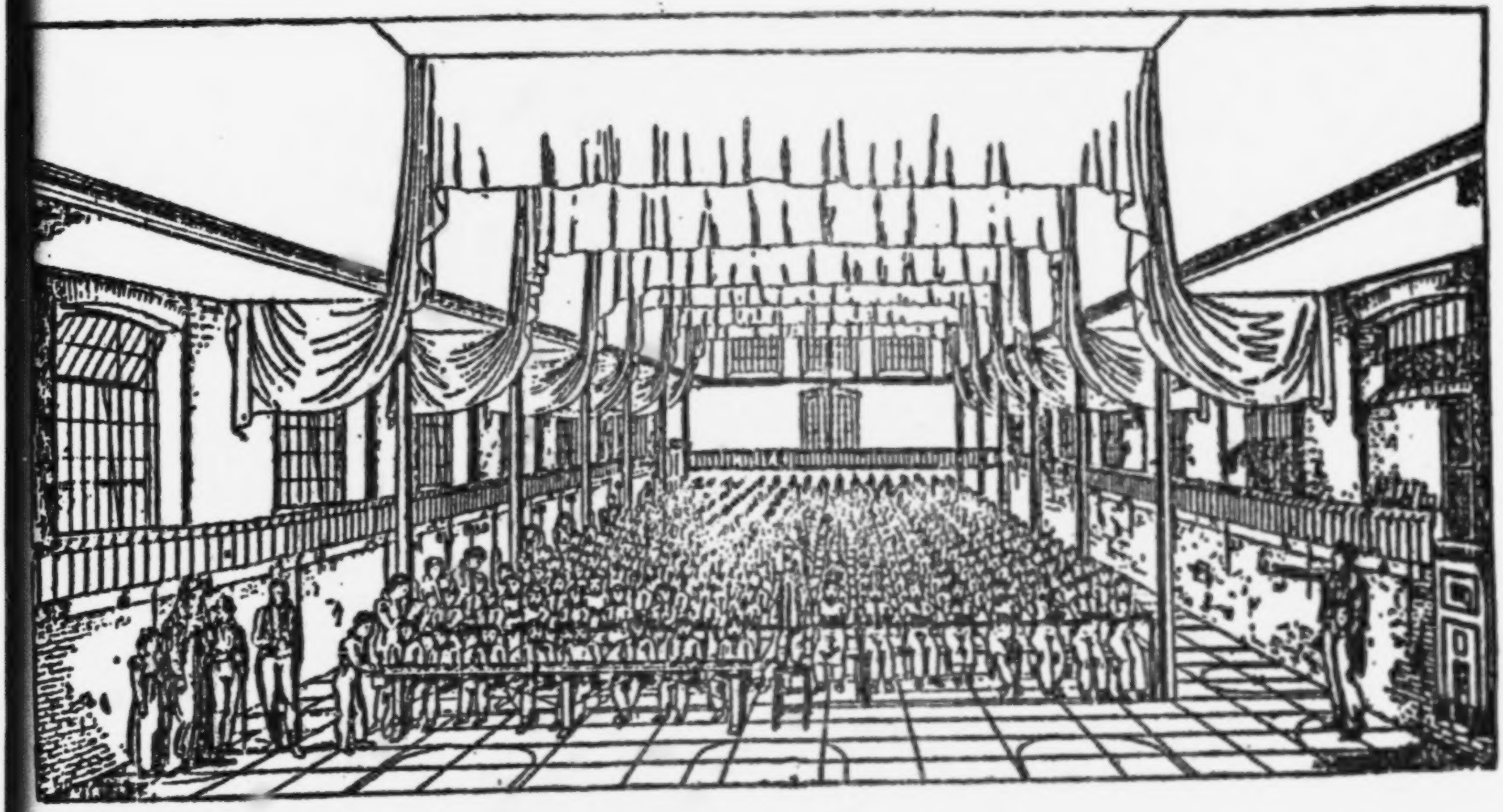
The following historical fiction was prepared to illustrate what might have been the educational specifications for the first Lancastrian-Monitorial School in America. The chief purpose is to illustrate the organization and content of educational specifications, especially as they might have appeared in the early 19th century.

EDUCATIONAL SPECIFICATIONS
LANCASTRIAN-MONITORIAL SCHOOL NO. 1

New York City, 1806
(See Figure 1)

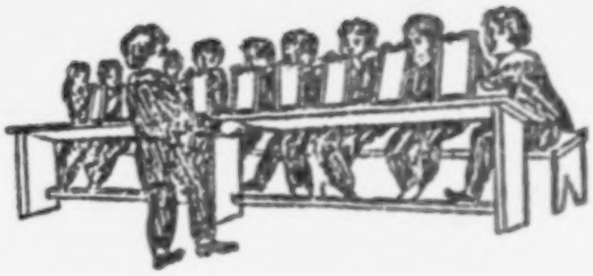
I. Philosophy

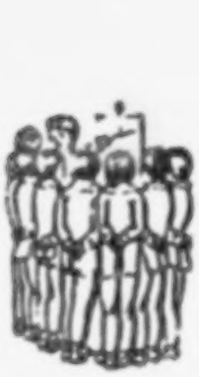
All male citizens need some basic skills and religious training in order to contribute to our society. The educational system should teach these skills cheaply and effectively and it is the public responsibility to provide the finances for instructors, materials, and facilities. The system should be simple and practical, much like a factory system.



A LANCASTRIAN-MONOTORIAL CLASSROOM

FIGURE 1





II. Program

A. Skills to be learned:

Reading	Spelling
Catechism	English Grammar
Writing	Geography
Sums	

B. Methodology

1. Large group instruction

   The master will teach each lesson to a large group of 50 clever boys who are called monitors.

2. Small group instruction

   The monitors will in turn instruct ten pupils each.

3. Drill

   The pupils will be drilled in the material to be learned until all have mastered it. They may be drilled at their benches where they may write on slates or as they stand around the room in groups viewing visual aids in the form of charts which will be hung on the walls.

C. Organization

The organization will be similar to that of the military. Each group of ten pupils will be organized into a squad with a monitor assigned for instruction. The monitors will have certain other assigned responsibilities; one will be attendance monitor with an assistant who determines the reasons for absences; one will examine the pupils periodically and promote them when they have mastered the material; one rules the paper; and one tends the slates and books.

There is a monitor general in charge of all monitors. Each monitor wears a leather ticket, gilded and lettered with his particular duty and responsibility.

D. Motivation

Certain devices will be used to reward success and discourage failure. When the pupil is successful, he will be rewarded; and when he fails, he will be punished. The pupils will be encouraged to compete with each other for rewards.

III. Furniture and Equipment

A. Benches

Fixed benches will be provided for 500 pupils; a writing board will be placed in front of each row which will be used by the pupils when they write on slates.

B. Sand Tables

Several sand tables will be placed around the room to be used for practice in writing.

C. Blackboard

Panels of blackboard on which the pupils may practice writing will be placed around the walls.

D. Hooks

Hooks will be placed on the side walls on which charts may be hung. The pupils will read them as they stand in groups.

E. Platform

A fixed platform should be provided for the master, placed in such a position so that he might have visual control of the entire hall and high enough that he might be able to view all pupils. An inclined plane may be used for the same purpose.

IV. Storage

A. Shelves

Storage shelves are needed for 250 slates, boxes of chalk, and eraser clothes. Shelves are needed for attendance and assignment records, and teaching aids.

B. Closet

A closet is needed for storage of cleaning equipment and the monitors' stools.

V. Expandability

A school for 500 is adequate for the immediate foreseeable future. However, Dr. Andrew Bell has demonstrated that up to 1,000 pupils may be instructed satisfactorily by one strong master. Also, we do not know how much growth our city may have. Therefore, the hall should be designed to provide for expansion to double the original size.

VI. Relationship of Spaces

The Lancastrian-Monitorial School (illustrated in Figure 1) actually looked like a large assembly hall. It could have been appropriately called a drill hall, for that is what it was.

The Lancastrian drill hall provided space for all pupils to sit closely on rows of benches and open floor space for the monitors to gather their "squads" around them for practice drill.

Grammar Schools in the 1840's

The success of the Lancastrian-Monitorial School depended upon the limited needs for education in the early 19th century and a strong master teacher. As the needs for education increased, the system proved inadequate. Strong-willed disciplinarians, with an interest in education, were not sufficient in numbers to "command" these schools; and chaos was too often prevalent rather than quiet, well-ordered learning.

The typical ungraded grammar school of the 1840's provided large and small group instruction with the main schoolroom having over 200 seats. Each floor operated as a separate school under one master. The two small rooms were to be used by assistant teachers working with small groups.

The divisions were based on curriculum, sex, and age group. In Boston, in 1840, the upper floor was used by the writing school, the lower by the reading school. The typical school in New York City was three stories. The infant or primary school was on the first floor; girls' school on the second; and the boys' school on the third. Each floor seated 252 children. The primary schoolroom could be divided with folding doors to separate the infant class from the older primary children.

The Graded Grammar School

By mid-nineteenth century the concept of supporting education with public taxes was becoming generally accepted. The stage was set for smaller groups of children, graded to achievement levels and taught in a series of equally sized rooms.

The educators in Boston may not have employed an architect, and certainly saw no need for educational specifications. If they had, the result may have been similar to that which follows:

QUINCY GRAMMAR SCHOOL
BOSTON, MASSACHUSETTS
1940

(See Figure 3)

I. Philosophy

The acquisition of knowledge is the supreme motive for education. Knowledge and virtue are closely related, in fact, somewhat synonymous. The school exists to teach the facts which must be learned, to those who can learn them. Those who cannot learn, or who have learned all they can, should leave school to help their family with making a living. Scholars will select the subject matter which must be learned.

II. Program

A. Courses

- Reading
- Writing
- Arithmetic
- English Grammar
- Geography
- Spelling
- History

B. Methodology

The teacher will drill the pupils in the fundamental subjects. The pupil will be expected to rise from his seat and recite his lessons to the class when he is called upon.

C. Self-contained Classroom

Each master will have a group for a year. Each group may have as many as 55 pupils. These groups will be graded as to their progress at the beginning of each year.

III. Furniture and Equipment

A. Desks

Fifty-five (55) individual desks are needed in each room. Each desk must have an accompanying book compartment for the pupil's books and writing supplies. The desks should be placed in even rows for walking. These desks should be bolted to the floor so they will not slide around, causing noise.

B. Blackboard

The front, back, and one side wall should have as much blackboard as can be placed there.

C. Monitor's Platform

Each classroom shall have a small, movable platform on which a pupil monitor may sit.

D. Instructional Materials

All Classrooms:

Globe
Two sets of outline maps

Upper Elementary Rooms:

One set of Boston Philosophical by J. M. Wightman

IV. Spaces (Figure 2)

A. Instructional Space

Twelve classrooms are required
Each shall have space for hanging cloaks and coats
Each shall have space for placing supplies which will be out of sight and can be locked.

B. Principal's Office

C. Assembly Space

A space is needed which will seat the entire group of pupils and teachers.

D. Heating System and Storage

Area will be needed for furnaces and fuel storage. A central heating system is needed. Space is needed for storage of equipment, furniture and supplies. The storage space should be placed at or near ground level.

E. Attic

This area can be utilized for gymnastic exercises and storage.

V. Relationship of Spaces

A. Classrooms

Classrooms may be grouped in any manner so far as education is concerned. Concern should be given for circulation in corridors.

B. Assembly Space

Assembly space will be used by all teachers and pupils and should be centrally located to classrooms.

C. Principal's Office

Centrally located to all classrooms.

D. Heating System

Location should be away from classrooms because of the dirt from the area, the noise from firing the furnaces, putting in coal, and the remote possibility of fire. The location should be at ground level for convenient fuel delivery and storage.

E. Storage

Location should be convenient to classrooms and deliveries.

Figure 2 represents the results of an architect's preliminary study of the problems presented in the Educational Specifications for the Quincy Grammar School. Compromises had to be made because of the limited site and the building became multi-storied. Figure 3 is an exterior view of the building.

In reality, the Quincy Grammar School was composed of four floors, in addition to a basement and an attic. The first three floors had four classrooms each and the fourth the assembly hall with pew-like benches. The basement housed the furnaces and the attic the gymnastic program. Each classroom was 31' by 26', providing 15 square feet per child, which would seem to be quite adequate for the program described above. The individual desks were an improvement over the benches used previously. This school continued to serve as a model through the last half of the 19th century.

Changes in philosophy brought changes in the curriculum. The pupil was thought to be a passive recipient of subject matter, acting as a sponge to absorb information. Certain facts were necessary for adult life, and educators could determine what these were. Slowly there came a realization that pupils were individuals, important in themselves. As the volume of knowledge grew, it became more difficult to determine what must be taught, and more important to give the pupil tools for attacking new situations in order that he could function more efficiently in adult life and continue to investigate and learn.

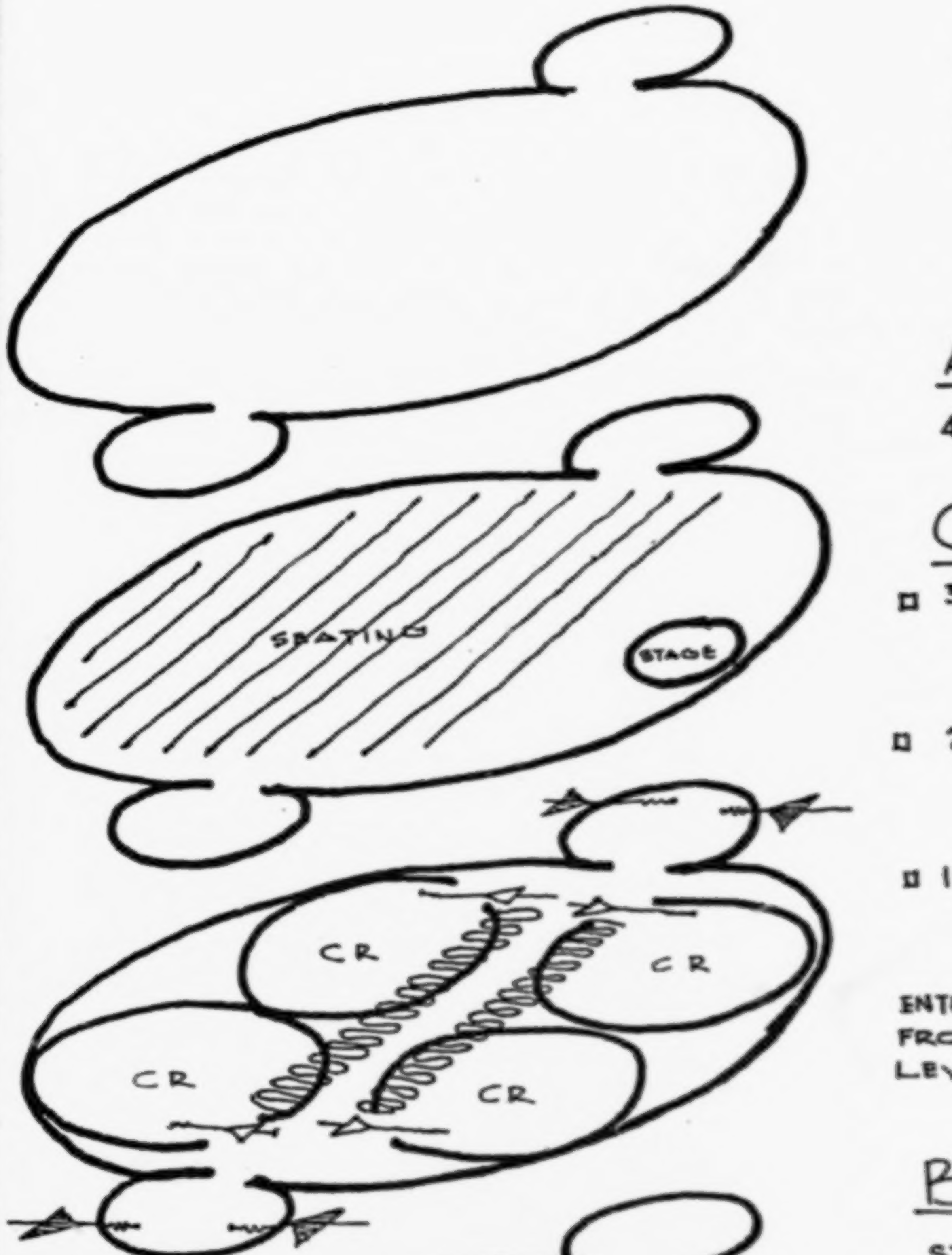
The change brought more individualized instruction and a variety of activities in which the pupils take part. These include audio-visual materials and a great variety of additional courses. The rooms have become larger, and the furniture no longer bolted to the floor; open shelves and new storage spaces are necessary for educational supplies; and sinks with running water are needed for science experiments, art work, or other activities.

The Dalton Plan provided for a differential in abilities and interests. Each pupil got his contract for the term and worked to fulfill his planned obligation at his own rate under the supervision of the teacher. The program caused changes in facility design and size of spaces, indicating very small classrooms of about 550 square feet.

Secondary education emerged as an extension of the elementary school; but as more and more pupils were continuing farther in school, the ability and interest range increased. Music, physical education, and science were added to the curriculum. The school's community service concept made necessary more space and special areas, and provision for them to be kept open at night.

Presently, program changes were in the making. Methods of presentation and size of groups are significant to facility needs. New arrangements of space in the school plant were sought in order to accommodate the changing program. The traditional 30 pupil classrooms without provision for adapting spaces received critical analysis as to their effectiveness for present and future education.

Audio-visual aids have become more important. The electronic explosion gives promise of additional devices which educators will surely want to use.


SEATING
STAGE
CR
CR
CR
CR
HEATER EQUIP.
COAL STORAGE
COAL CHUTE FROM NATURAL GRADE OPENING

ATTIC

STORAGE AREA
(USE FOR PHYSICAL EDUCATION CLASS)

ASSEMBLY

4TH FLOOR

CLASSROOMS

☐ 3RD FLOOR

☐ 2ND FLOOR

☐ 1ST FLOOR

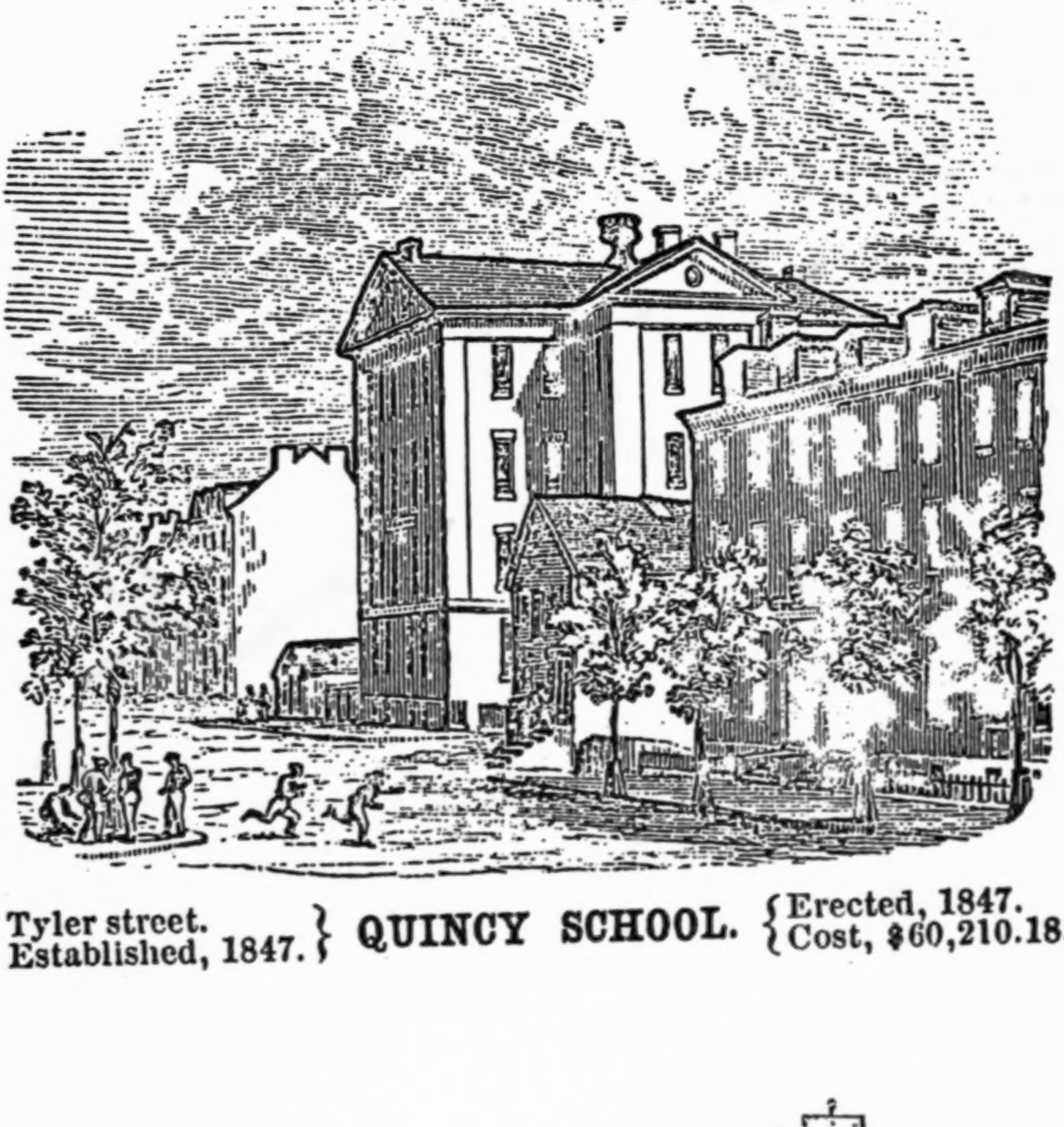
ENTRY TO THE BUILDING FROM 1ST FLOOR LEVEL, ONLY.

BASEMENT

STORAGE, HEATING EQUIP. & COAL BINS. THIS FLOOR BELOW NATURAL GRADE.

QUINCY SCHOOL

Fig. 2



Tyler street.
Established, 1847. } **QUINCY SCHOOL.** { Erected, 1847.
Cost, $60,210.18.

Figure 3

HISTORY OF SCHOOLHOUSE PLANNING

During the 19th century, schools were designed in two notable ways. Many small buildings, particularly in the rural areas, were built by someone in the community who had a practical knowledge of construction. Plans and specifications were not considered necessary. The second was for the school district to purchase stock plans and specifications which were drawn by an "expert" experienced in school design. The "expert" was usually an architecturally trained person with experience as an employee of a school district.

The United States Bureau of Education Bulletin of 1910 published an article suggesting that the professional educator guide the architect in planning a school. The Board of Education was discouraged from the continued use of stock plans. The article implied that the individual design was necessary to accommodate the individual program. The article further expressed the idea that before 1910 the lack of community interest had placed attractiveness and quality construction of school facilities in a position second in importance to that of other public buildings.

The first mention of educational specifications in a national publication was in 1919. Charles H. Judd used the term in a National Education Association publication and argued that, "educational statements should be written with the preciseness and clarity of architectural specifications."

The National Council on Schoolhouse Construction was organized in 1921. It is the oldest and most influential of those organizations dealing with school planning. In 1930, it published recommendations concerning minimum space and other requirements for various areas of the school plant. In 1946, the National Council on Schoolhouse Construction changed the format of their publication from a schedule of recommended minimums. They felt that their recommendations had been too restrictive. They directed their efforts, thereafter, toward a stronger emphasis on the principles and goals of planning. In recent years they have strongly suggested that the educators prepare written educational specifications expressing these goals.

The first actual production of instructions for architects did not begin until after World War II. In 1946 and 1947, the school officials of Cincinnati, Ohio, and Oklahoma City, Oklahoma, published school planning documents called Manuals for Architects. These were written for a specific application to new facilities on a district-wide basis. The Program of Educational and Community Requirements for Central High School, Louisville, Kentucky, appeared in 1948. Charlotte, North Carolina; Lynchburg, Virginia; New York City, New York; and numerous other cities followed with their first efforts at providing a written statement of educational requirements. These early samples had no statement of the educational program, or a very brief one. They did contain a list of spaces and usually the desired size of the space in square feet.

In 1947, Russell Wilson, of the University of Michigan, completed the first major study of educational specifications from samples drawn from across the United States. Since then, other school systems have developed written educational plans, with the greatest activity in geographic areas where the services of consultants in school plant planning were available.

About one-third of the counties and junior colleges in Florida have prepared educational specifications. The School Plant Planning Section encourages this and offers information and consultation throughout the planning stage. The best information which is available indicates that Volusia, Brevard and Duval Counties were the early leaders, providing their first written educational requirements about 1960.

In 1960, the staff of Milton High School of Santa Rosa County, guided by assistance from the State Department of Education, prepared written educational specifications for an addition to an existing school plant. This document is still distributed by the School Plant Office as a good example of what should be included in educational specifications.

An evolution of the content of the written documents took place and has continued from 1946, to the present. Today, the context of the typical educational specifications is much more than a listing of spaces. They now contain a statement of philosophy, a description of program, a listing of furniture and equipment, a schedule of spaces and other information related to use and function.

EDUCATIONAL SPECIFICATIONS - DEFINITION AND CONTENT

Definition

It is difficult to get a definition which meets with universal agreement. The following definition encompasses the concept held concerning educational specifications by the School Plant Planning Office of the State Department of Education.

> Educational specifications are a well ORGANIZED, CONCISELY WRITTEN statement of an INSTRUCTIONAL PROGRAM which is to house the new SCHOOL PLANT.
>
> Educational specifications constitute the PROBLEM. The architectural plans and school plant constitute the SOLUTION.

Some of the words are emphasized. The communications concerning the instructional program must be written to be of the greatest guidance to the architect. It is easy to generalize and discuss possible alternatives when the instructions are not written. The needs of education are far too complex today to trust to oral communication. Clarity and conciseness are imperative and apparent.

The term, school plant, is used rather than building or facility. School plant is a much broader term, referring to everything that is found on a site that is the part of a school facility. This includes play grounds, athletic fields, outdoor teaching areas, service facilities, drives, parking areas, storage areas, and other needs peculiar to a particular school.

Communication

The primary purpose is communication of the educational to the architect. Figure 4 is to reinforce that which is written so that the reader will keep the idea foremost in mind.

People have difficulty communicating. Educators in the same field have this difficulty. In the case of planning schools, communications must be between two dissimilar professions. The bodies of knowledge and the talents, interests, temperaments of the people, must place educators and architects somewhere near opposite poles.

Architects may read extensively about education; they may visit schools frequently; they may have children of their own attending school. These experiences do not equip them for making decisions concerning programs of instruction which will go into new facilities. The architect would, of necessity, need to be a trained educator-planner to understand both views.

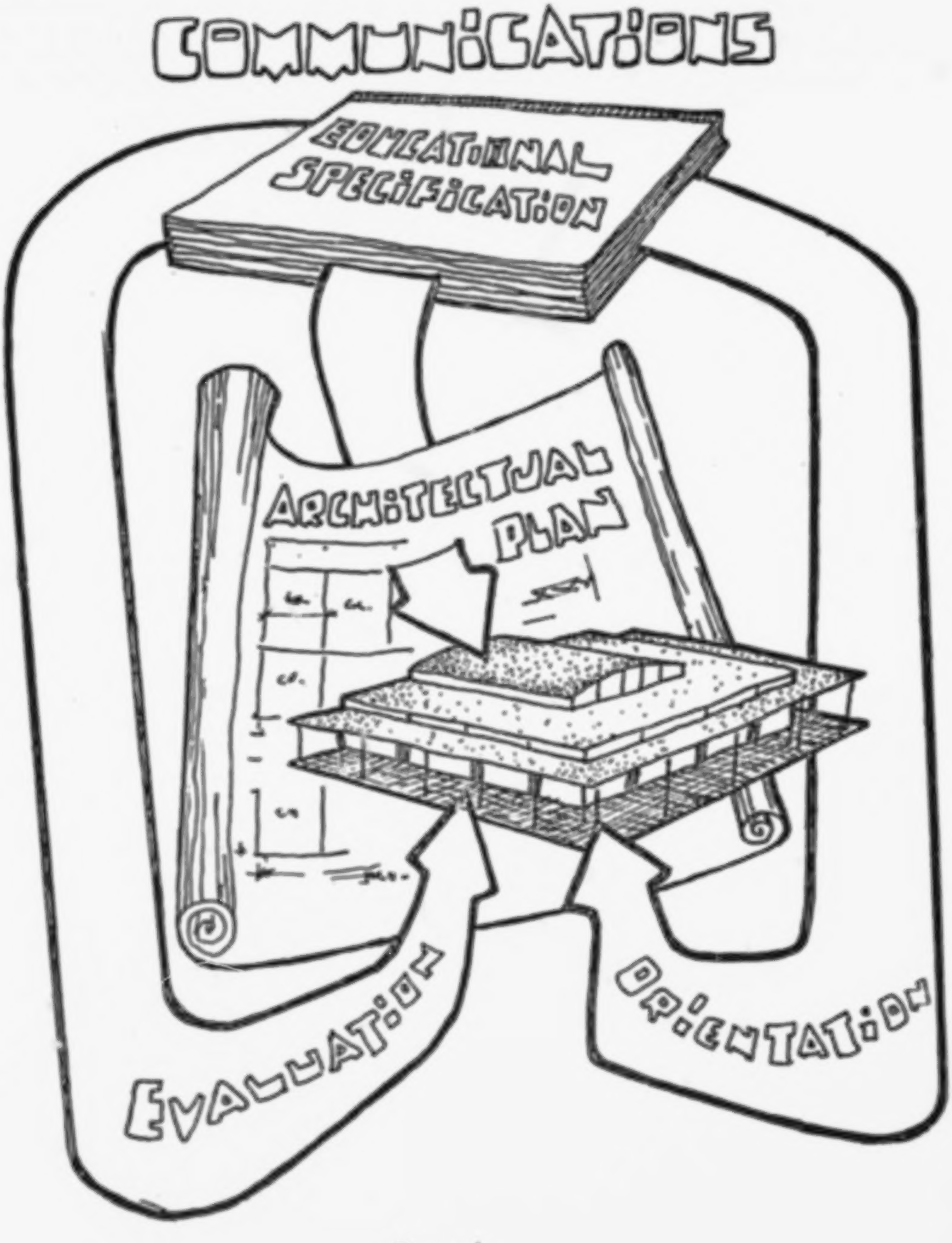

COMMUNICATIONS
EDUCATIONAL SPECIFICATION
ARCHITECTURAL PLAN
EVALUATION
ORIENTATION

Figure 4

The educator is trained in pupil behavior, psychology and learning theories as well as the specialized areas; the architect is trained to organize space, flow of traffic, strength of materials and the techniques of building construction. The aim of this combination of professionals is the same, but they travel different routes toward this common target. This problem of communication is not insurmountable, but it is a problem and bridging this communications gap is one of the major efforts on the part of the educator-planner.

In-Service Program

Some valuable by-products are available from the preparation of educational specifications. It can be a very fine in-service training program for curriculum study and development. Faculties have been known to awake from lethargy when confronted with the responsibility for planning new facilities. The organization and pattern of decision making suggested later in this bulletin involve staff members in the democratic process for determining programs which they must support and implement.

Orientation of New Staff

The principal, and at least the key staff members, should be assigned well in advance of the completion of a new school. They may or may not have been included in the planning. In either event, they should become oriented to the new building by studying the educational specifications, reviewing the architectural plans, meeting with the committees and planning the details of their program to use the building as intended.

It is vitally necessary for the staff to familiarize themselves with the new program and facilities in order that they fully understand that their educational program from the old facilities does not, in most cases, fit into the new design. Orientation to new facilities is also important in order to utilize the new facilities to best advantage.

Equipping Building

The educational specifications should contain information concerning furniture and equipment where such information is important to the amount and arrangement of space or utility needs. This information should be the basis for equipment and furniture selection.

Color and the reflectance value of furniture and equipment are important to lighting, and in turn seeing, therefore a factor in its selection. Whoever has the responsibility for selecting furniture and equipment should coordinate the colors and finishes with those selected by the architect. The architect may be employed to do this for furniture and equipment, which is not a part of the construction contract.

RESPONSIBILITIES AND ROLES

County Board of Public Instruction

The county board of public instruction can provide the basis for adequate educational planning by adopting sound policy with regard to the preparation of educational specifications. This policy may include:

1. Instructions to the superintendent to provide written educational specifications for all new construction, including additions, and for any extensive renovation or remodeling.
2. To approve all written educational specifications as recommended by the superintendent.
3. After approving the educational specifications the board should require that these be presented to the project architect with instructions that they be followed in designing new construction.
4. Approve budgets for construction projects as recommended by the superintendent. The board should instruct the superintendent to work with the architect and instructional staff in determining priorities in the event that the educational requirements cannot be met within the budget available; or for recommending additional money if the educational program warrants and the money is available.
5. Employ the architect early in the planning phase so that he can become familiar with the educational planning of the project as it progresses.
6. If possible, employ the principal prior to the educational planning. He may then provide the leadership in the preparation of educational specifications. He could further provide leadership in orienting his staff in development of the instructional program before the building is occupied.

Superintendent

The superintendent, as the administrative head, instructional leader, and as the chief agent of the board of public instruction, is responsible for seeing that the educational specifications are written. In most counties it will be necessary for the superintendent to assign someone on his staff to direct the planning.

The superintendent must retain the responsibility for the written educational specifications and should evaluate the progress made. He should present the finished product, with his interpretations and recommendations, including approval of the document and priorities for construction, to the board of public instruction. He also bears a responsibility for interpreting them to the public in order that it may understand the educational and building program. This method of keeping the public informed is helpful when financial support is needed.

Staff

Responsibility for the actual work in the preparation of the written educational specifications must fall to those who are finally responsible for the operation of the instructional program. The staff should project its thinking into the immediate future, (two or three years hence) when the new facilities will be ready, and somewhat into the distant future when the facilities must meet the needs of future programs. The staff should have a thorough understanding of the purposes of education and the nature, needs, and characteristics of the pupils involved. It should be acquainted with the research which has been done relative to the fields and the trends in education as related to developing programs.

The responsibility for answering all questions regarding the instructional program should fall to the instructional staff. Teachers, supervisors, and administrators who have the responsibility for the direction of instruction should be included. Special areas which complement instruction, such as guidance, administration, library, and those necessary for the smooth operation of the plant, such as storage and work space for maintenance and operation, and site considerations (transportation, service drives, parking) should be planned with the aid of the people who use these areas.

Both specialists and generalists are necessary. For example, science teachers and supervisors must be included in planning the science facilities. The rapidity of change in science curriculum has caused a development of specialists within the science field. Music involves technical knowledge, requiring the inclusion of music specialists. An administrator or board of public instruction would most certainly want to include music, science and other specialists in the planning of instruction and facilities for this curriculum.

Specialists are necessarily concerned with their area of specialization. Generalists are the supervisors and administrators who come in contact with the broader program.

Project Architect

The architect has a responsibility to provide the design solution which best answers the requirements of the educational program. His solution should permit the educational program to function adequately and without restriction.

The project architect should be employed as early as possible and participate in the educational planning phase as an advisor on technical, aesthetic, and cost considerations. In no case, should the selection of the architect delay the beginning of the educational planning phase. If an architect has been selected he could become acquainted with the total educational program as it relates to the design problem that he will be called upon to solve. He should not be expected to make educational planning decisions.

The architect should expect to meet with the educational planning groups during the planning stage. The educators will react to the design solutions and coordinate these solutions with their instructions. Some staff member should coordinate the meetings and help the architect evaluate the advice.

The project architect should serve as a consultant to the staff of the new plant during orientation and again in evaluating the facility after it has been in use for approximately one school year.

School Board Planner

The school board architect, school planning department director, construction department supervisor, or other local person with the responsibility for coordinating construction, should participate in the educational planning. Representatives of this department should give advice, observe and ask questions where understanding is not clear.

The planning department, (in counties which have them) could coordinate the meetings between the educational planning staff and project architect. This department can serve in a leadership role in developing and evaluating the program.

Consultants

The school plant planning section of the Florida State Department of Education provides educational and architectural consultants for planning, on a request basis, to the counties and to junior colleges. Assistance and advice is given concerning the organization, techniques, procedures and the content of educational specifications.

The educational and architectural consultants work as a team throughout the planning stages to assist the person in the county in charge of educational planning organization. They orient the committee members to their task and return periodically to answer questions, react to ideas, give advice on progress, and evaluate the written material.

This team will then be familiar with the educational specifications. They can continue to serve as consultants to the school district and the project architect during the architectural planning phase. Early consultation will achieve the best results. The project architect and the person in charge of educational planning should arrange for meetings during schematic and preliminary planning.

A team of consultants may be included in developing evaluation procedures and materials, and participate in evaluating the facilities after they are open and operating.

Personnel from other offices, such as the Division of Community Junior Colleges, the Division of Instruction, the Division of Vocational and Adult Education, the Transportation Section, the School Lunch Section, or the School Plant Management Section, have assisted county personnel with problems falling in the area of their specialization. State Department personnel may be asked to review the written specifications if the county desires this service.

Some districts have used personnel from other counties, university staff members, and consultants from out of state. The educational consultant, regardless of his affiliation, should not dominate the planning. He may serve in an advisory capacity in regard to organizing for, and the preparation of the written specifications. In some cases, where time is limited, he may direct the planning. In no instance should he be made responsible for final decisions. These decisions should be made by the county personnel, and should reflect the local program of instruction as it falls within the scope of applicable laws and regulations.

Laymen and Pupils

Laymen should be included in the planning. Using them can provide one means of informing the public, and they can be selected to help gain support for education in the community and for financial assistance when needed. They will make a contribution, bringing a point of view lacking in the normal staff. Laymen should be carefully selected with the above contributions in mind.

The role of the pupil in an advisory capacity is highly recommended. Young people who are still in school, or recently out, can supply a point of view impossible to obtain from any other sector.

Lay people and pupils can serve in an advisory capacity or they can be included as voting members of committees. In either event, they can be expected to influence decisions but should not make educational decisions. Laymen and pupils should be thoroughly aware of their roles and given every opportunity to contribute to the successful completion of the educational planning responsibility.

ORGANIZATION

There are at least four ways to obtain educational specifications. They may be: (1) written by personnel on the central office staff of the county; (2) prepared by means of a cooperative effort, using teachers, supervisors, administrators, service personnel, and other people from the school district; (3) prepared by local personnel with guidance and assistance from outside consultants; (4) prepared by consultants from outside the district.

The cooperative approach can yield the most productive results. Each local system should preface its own educational specifications to meet its unique needs and aspirations. If consultants do advise in the preparation of educational specifications, care should be taken that the results reflect the educational program for the locality. Consultants can give valuable assistance, but the final decisions should be made by local personnel.

The use of a wide representation of talent from the school system is most desirable. The inclusion of numerous people from various sources to help plan is the most cumbersome to direct, and guiding the activity of this group requires the highest type of administrative ability. It may be wise for a beginning leader in the field of planning to involve only a few people. This would facilitate decision making and keep the lines of communication short and direct. One person could be made responsible for preparing each special area of the educational specifications. A steering committee of three to five members will be adequate to make basic overall decisions. More people may be included in projects when time is available and the participants have gained the experience in planning.

Size

In smaller districts the entire staff of an elementary or secondary school may be included in the planning groups. The size of the staff of most Florida districts will not permit this. In many instances, the educational planning of the school must be done before the principal and his staff for the new plant have been designated. However, the principal for the school may be appointed early enough in order that he may participate or provide leadership to the planning group. Personnel selected in a larger county should be included for their ability to contribute a point of view which reflects the thinking in the entire school system.

The size of the committees should be limited by the time and personnel available, keeping in mind that the larger the group the more difficult it becomes to reach agreement, but the broader the viewpoint included.

Another factor to consider is experience. The committees should be kept smaller if the staff has little or no experience at group decision making.

A number of the faster growing districts in Florida have prepared standard educational specifications with committees organized on a county-wide basis, attempting to include the various needs as found in the county. The materials are then adapted to the particular community when specific new schools are planned. Preparing different educational specifications for each new plant is good in theory but may be virtually impossible in practice in some districts.

Committee Organization

Organizations differ in the school districts because of unique needs, size of district, personnel available, and for many other reasons. Suggestions are made of a few possible solutions. The most successful are those which have been evaluated carefully and adapted to the local needs.

Figure (5) illustrates a typical organization for a school district which has separate elementary, junior and senior high schools. Figure (6) may be for a district on the 6-6 plan. The organizational charts show the lines of authority and decision making which should be clearly understood.

Each project needs a "ramrod" to do the "leg work" of organizing and push needed for final completion. This person is usually the chairman and is appointed by the superintendent or a person recommended to the board for appointment by the superintendent. He is responsible directly to the superintendent and the school board. He serves as chairman of the entire project and may preside over meetings of the project steering committees, as needed.

Secretarial services are needed for the project. The amount of work connected with the project will probably be too great for the regular office staff secretaries. Most of the districts supply help as needed. It is customary, in some cases, to employ a special full time secretary for the time necessary to the full completion of the project.

The project steering committee should have a majority of educators who are generalists equipped to view the instructional program with complete perspective. It may also have some lay members, teachers and students.

Planning committees are needed for each level or type of school in the system (elementary, junior high school or senior high school) and chairman and steering committee members selected to function as discussed above. The composition of these committees should reflect a perspective for all education at that level. The majority should be principals and supervisors. Teachers, lay members and pupils may be included.

The editing committee, shown as an appendage to each steering committee, is a very necessary part and should be appointed early in order that they may edit and compile as work progresses.

FIGURE 5

EDUCATIONAL SPECIFICATIONS COMMITTEES

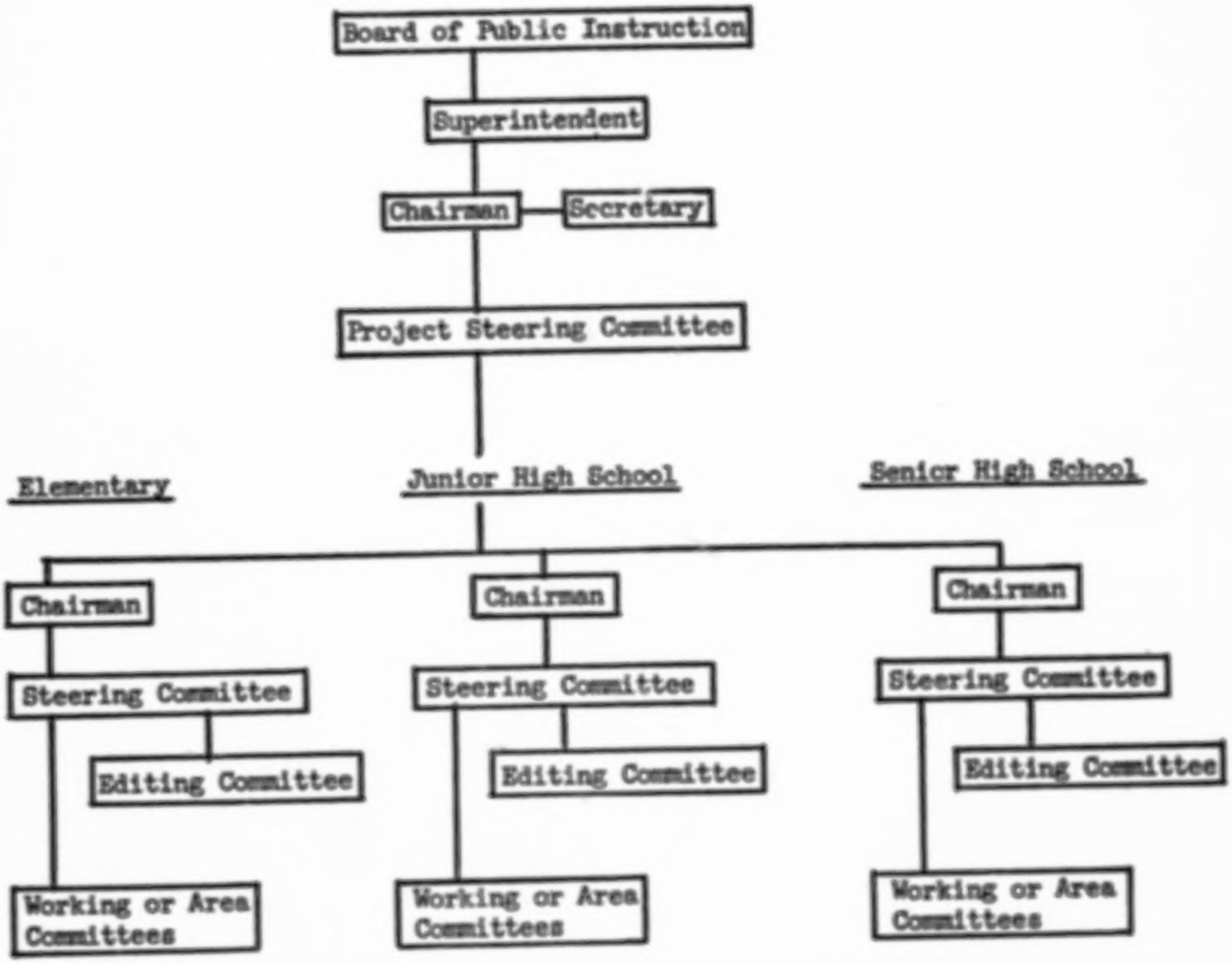

Board of Public Instruction
Superintendent
Chairman
Secretary
Project Steering Committee
Elementary
Junior High School
Senior High School
Chairman
Steering Committee
Editing Committee
Working or Area Committees
Chairman
Steering Committee
Editing Committee
Working or Area Committees
Chairman
Steering Committee
Editing Committee
Working or Area Committees

FIGURE 6

EDUCATIONAL SPECIFICATIONS COMMITTEES

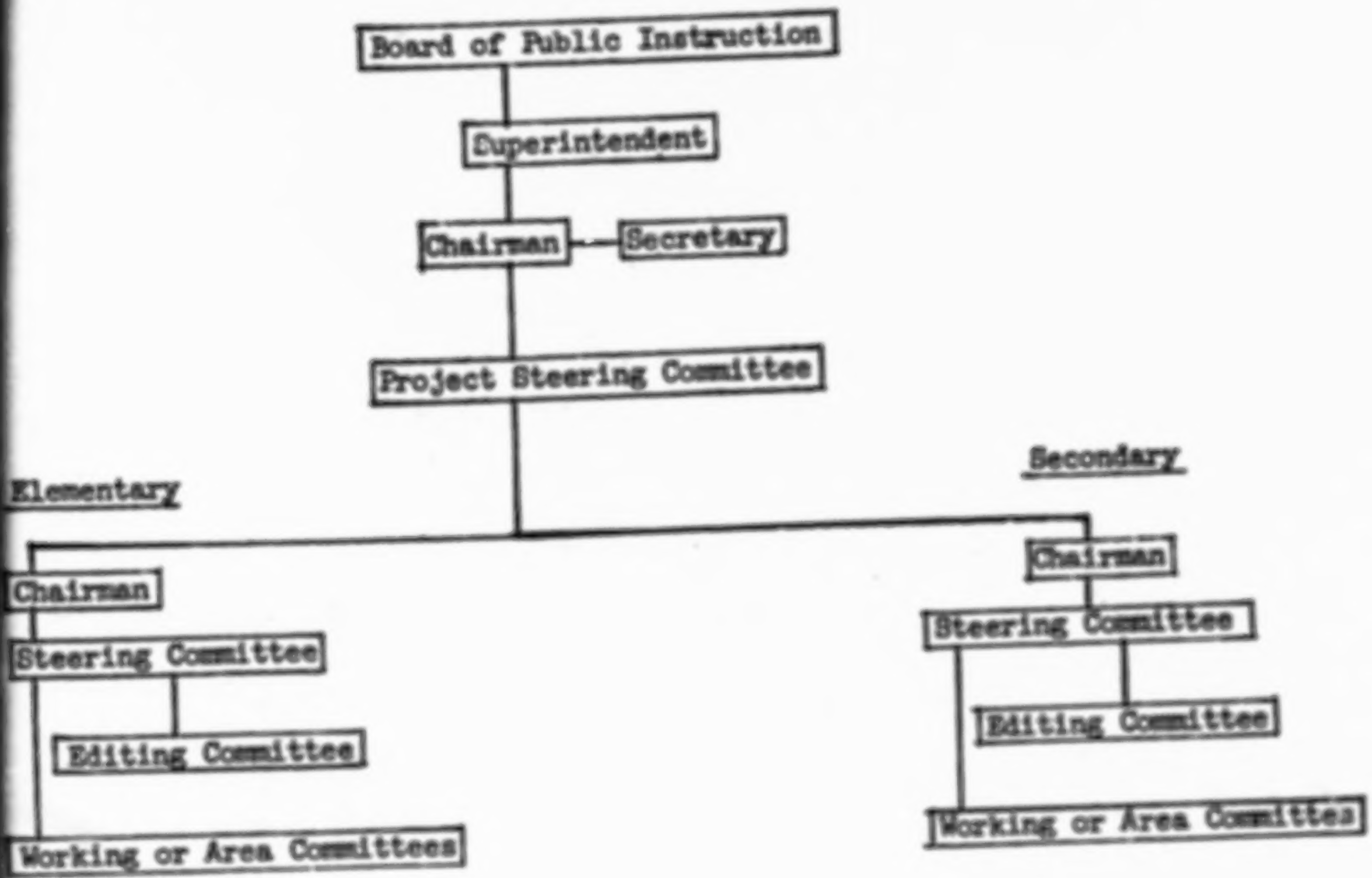
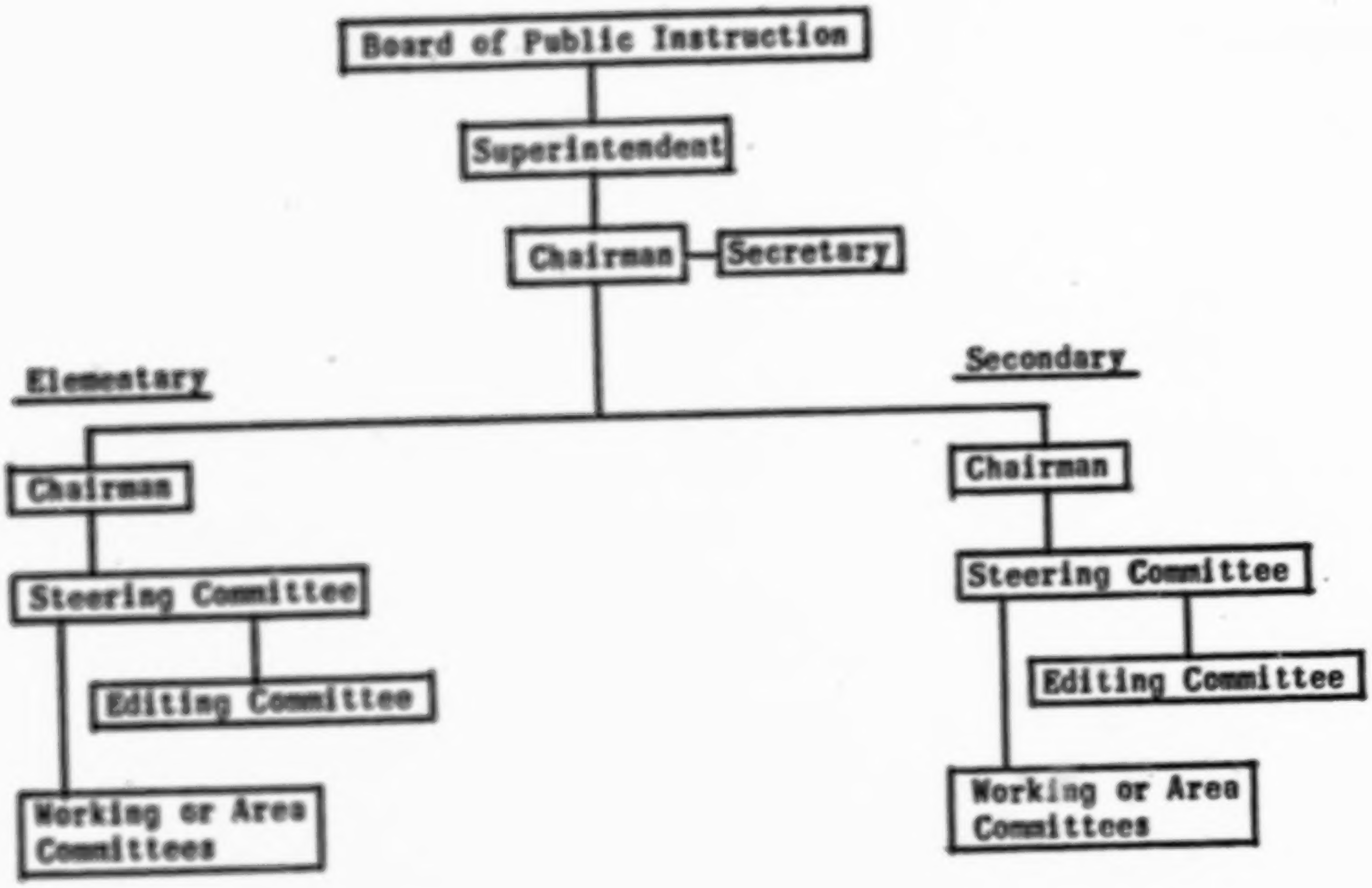

Board of Public Instruction
Superintendent
Chairman
Secretary
Project Steering Committee
Elementary
Chairman
Steering Committee
Editing Committee
Working or Area Committees
Secondary
Chairman
Steering Committee
Editing Committee
Working or Area Committes

FIGURE 7

EDUCATIONAL SPECIFICATIONS COMMITTEE


Board of Public Instruction
Superintendent
Chairman
Secretary
Elementary
Secondary
Chairman
Steering Committee
Editing Committee
Working or Area Committees
Chairman
Steering Committee
Editing Committee
Working or Area Committees

Working or Area Committees

Working groups should be organized as they are needed. The following may give some guidance in determining elementary committees needed:

Primary
Elementary
Food Services
Assembly - Multi-Purpose
Administrative
Art
Music
Physical Education
Site Planning - Pupil Transportation, parking, service drives, relationship of spaces
Special Education
Storage and work space for custodians and maintenance men
Teacher planning and work
Library and Materials Center

A junior high planning group may include committees working in the following areas:

Administration
Art
Assembly, Dramatics, Language group instruction
Food Services
Language Arts
Social Studies
Mathematics
Science
Foreign Languages
Teacher Planning and Work Space
Guidance
Homemaking
Industrial Arts
Library and Materials Center
Music
Physical Education
Special Education
Site Planning - Pupil Transportation, parking, service drives, relationship of spaces
Storage and work space for custodians and maintenance men

A high school planning organization may find need for considering the following areas:

Administration
Art
Assembly, Dramatics, Large Group Instruction
Business Education
Food Services
Guidance
Health, P. E., and Driver Education
Homemaking
Industrial Arts
Foreign Languages
Social Studies
Language Arts
Mathematics
Science
Library and Materials Center
Music
Site Planning - Pupil Transportation, parking, service drives, relationship of spaces
Special Education
Storage and work space for custodians and maintenance men
Teacher Planning and Work Space
Vocational and Technical

TECHNIQUES AND PROCEDURES

Decision Making

Decision making by a group of people working cooperatively can be complex and require long and involved discussion. A few techniques and procedures are suggested to minimize the time involved for solutions. The process of reaching decisions requires careful consideration on many sides of an issue. The give and take of the members of a committee is a necessary part of this process. The chairman should use his skill to determine when the discussion has served its purpose and when a decision should be made.

Care should be taken that the personal desires of individuals or small groups are not planned into the building. The selection of participants should be made with consideration of how well they represent the overall thinking of a district, rather than the thinking of a select or minority group. The chairman should prevent an outspoken or strong-willed minority from dominating the group.

Wide involvement of people in making decisions has many benefits. A staff that has participated in the planning will be in a better position to understand the reasons behind the result. They will feel more of a responsibility, having had a part in planning the building program, and be more inclined to look with favor on the results than those who did not participate. Better public relations should result through the contact the staff members have with the general public. Including lay citizens and pupils in the planning group can have similar results.

Recommendations of working committees should be considered when final decisions are made, even though all of the proposals are not accepted. The working personnel should be informed at the outset that their contributions are desired and will receive consideration but that it may be impossible to implement every idea.

A small steering committee seems desirable to pass final judgment on the results of the efforts of working committees. This committee should be kept small to facilitate decision making.

Size will depend upon the time available for planning and the experience of the personnel in working together. The members on the steering committee should have backgrounds which give them the perspective required to understand the overall program and the contribution that individual parts make. These factors are necessary in order to avoid over-emphasizing certain areas and facilities to the detriment of others.

Insuring Progress

Steering committees must set deadlines and check group progress regularly. The tendency on the part of some people to procrastinate requires a periodic check. The committees, at times, may flounder, be reluctant to ask questions, not know how to define their problems, and need a re-orientation. Such problems, when unobserved, can cause serious delays.

The outline of educational specifications which follows may be used for organizing the entire document.

OUTLINE OF EDUCATIONAL SPECIFICATIONS

I. Introduction

  A. Philosophy and Purpose of Planning Educational Facilities

    1. Purpose of Educational Facilities
    2. Philosophy and Purposes of the School Program

  B. Psychological and Physiological Nature of Pupils to be Served

  C. Organization and Personnel of the School

  D. Projected Enrollment and Breakdown by Grades and Subject Areas

  E. Optimum Size of a Proposed School

II. Site

III. General Education Spaces

  A. Special Spaces for General Education

    1. Business Education
    2. Foreign Languages
    3. Language Arts
    4. Mathematics
    5. Social Studies

  B. Interchangeable and Multiple Use Spaces

    1. General Spaces
    2. Large Group Spaces
    3. Small Group Spaces

IV. Special Education Classrooms

  A. Art

  B. Business Education

  C. Health, Physical Education and Driver Education

  D. Home Economics

B. Utilities

1. Gas
2. Electrical
3. Communications
4. Water
5. Sewage

C. Storage Related to Instruction

D. Floor Materials and Room Finishes

V. Space Needs and Relationships

A. Relationship of Activities and Equipment Within the Instructional Area

B. Relationship of this Instructional Area to Other Areas of the School

C. Circle Diagrams Illustrating A and B

D. Square Footage Needed as a Guide Only (Should meet Level 3 of Accreditation Standards)

VI. Bibliography

Any problems that arise should be noted in the applicable section.

The following was developed by a junior high school steering committee but it may have some application to all levels:

Format for Junior High School Area Committee Final Reports

I. General Objectives and Philosophy of the Program Area

II. Course Content and Activities

  A. List and Describe Course

  B. General Description of Teaching and Learning Activities

    1. Activities of Teacher
    2. Activities of Pupil
    3. Methods of Instruction

III. Teaching Materials, Instructional Equipment, and Furniture

  A. Materials

    1. Reading Materials (Books, Magazines, Papers, Reference, Others)
    2. Visual
    3. Audio

  B. Instructional Equipment

    1. Visual
    2. Audio
    3. Built-in

  C. Furniture

    1. Movable
    2. Audio

  C. Other Information as Necessary

IV. Special Considerations

  A. Environmental

    1. Visual
    2. Hearing
    3. Perceptual - Color, Design, Space
    4. Special Lighting

The following was developed by a junior high school steering committee but it may have some application to all levels:

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III. Teaching Materials, Instructional Equipment, and Furniture

   A. Materials

      1. Reading Materials (Books, Magazines, Papers, Reference, Others)
      2. Visual
      3. Audio

   B. Instructional Equipment

      1. Visual
      2. Audio
      3. Built-in

   C. Furniture

      1. Movable
      2. Audio

   C. Other Information as Necessary

IV. Special Considerations

   A. Environmental

      1. Visual
      2. Hearing
      3. Perceptual - Color, Design, Space
      4. Special Lighting

(Programmed Materials - Continued)

        - a. Type
        - b. Quantity

    - 3. Visual
    - 4. Audio

- B. Instructional Equipment

    - 1. Visual
    - 2. Audio
    - 3. Built-in

- C. Furniture

    - 1. Movable

        - a. Quantity and Type

    - 2. Built-in

        - a. Quantity and Type

V. Planned and Anticipated Changes in Program

- A. Methods

- B. Organization

    - 1. Administration
    - 2. Schedule
    - 3. Size

- C. Materials

- D. Subject Matter

- E. Furniture

    - 1. Pupil
    - 2. Teacher

- F. Equipment

    - 1. Visual
    - 2. Audio
    - 3. Service

FORMAT FOR EDUCATIONAL SPECIFICATIONS
FOR INDIVIDUAL COURSES

I. Philosophy

- A. Junior College
- B. Individual Program
- C. Course Purposes and Objectives

II. Instructional Programs

- A. Course Title and/or Room Use
- B. Activities
  - 1. Teacher
  - 2. Students
- C. Grouping
  - 1. Size of Class
  - 2. Arrangement or Grouping of Students

III. Spaces, Areas or Rooms

- A. Number Needed
  - 1. Hours per week this class meets (Day-Evening)
  - 2. Number of sections expected in next phase
  - 3. Number of sections expected at maximum enrollment
  - 4. Number of spaces needed in next phase
  - 5. Number of spaces needed in maximum enrollment
- B. Furniture, Equipment, and Instructional Materials
- C. Environment
- D. Utilities

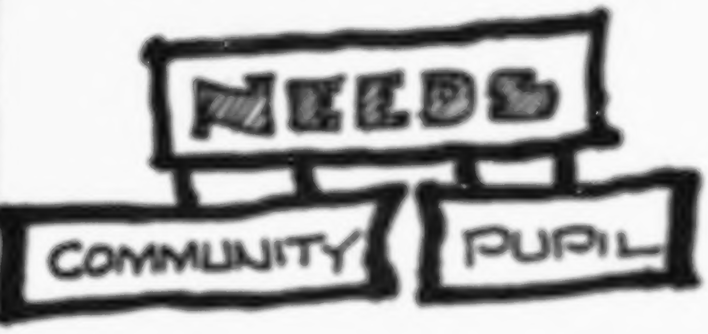
IV. Storage

- A. Number, Types, and Sizes of Items to be Stored
- B. Size of Cabinets or Shelving
- C. Size of Storage Area
  (Supply total size if the above is too difficult)

V. Relationships of the Area or Space

- A. To the Program
- B. To Those Programs Which are Closely Related
- C. To the Entire Campus

PROBLEM: SOLVE FOR NEEDS ✓


NEEDS
COMMUNITY
PUPIL

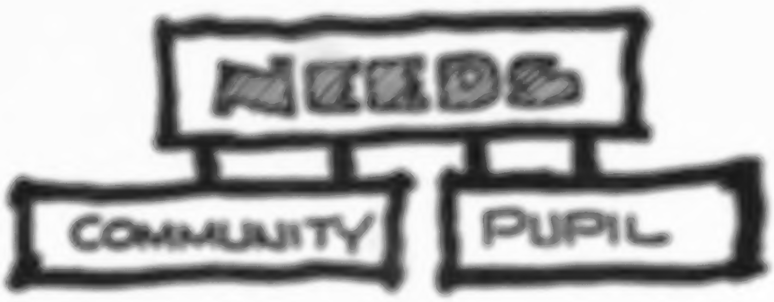
= SCHOOL PLANT = X

GIVEN:

[1] AIMS & OBJECTIVES = PHILOSOPHY ✓
[2] INSTRUCTIONAL PROGRAM ✓
[3] SPACE REQUIREMENTS ✓
[4] FURNITURE AND SPECIAL CONSIDERATIONS ✓

THEREFORE:

PHILOSOPHY + INSTRUCTIONAL PROGRAM + SPACE REQUIREMENTS ÷ FURNITURE AND SPECIAL CONSIDERATIONS = X = SCHOOL PLANT =


NEEDS
COMMUNITY
PUPIL

✓

VI. Special Considerations

A. Environmental

1. Visual
2. Hearing
3. Climate Control - Heating, Ventilating, Temperature
4. Perceptual - Color, Design, Space

B. Utilities

C. Service - School and Community

1. Access Drives and Parking

D. Storage

E. Floor Materials and Room Finishes (Performance qualities only)

VII. Space Needs and Relationships

A. Estimate of Space Needs

1. Projected Enrollment in Subject*
2. Policy of Group Sizes
3. Number of Sections of Each Size Group
4. Number of Periods in Schedule
5. Number of Teacher Stations Required
6. Estimated Amount of Square Footage Needed as a "Guide Only"

B. Relationships

1. Relationship of Activities and Equipment Within the Instructional Area
2. Relationship of Space Functions to Other Areas of School Plant

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*Projected enrollment in a subject is based on percentage taking program, modified by program changes times the total initial and maximum enrollment in the school.

Assembling all the work into a rough draft is a good technique to stimulate progress. The first rough draft should be prepared by the half-way point through the entire planning period. This draft should be executed even though some parts may not be ready. Duplicate enough copies; one for each member of the steering committee (elementary or secondary), each working group, members of the school planning department of the school district, and the project architect.

One technique is to assign copies by number or name to individuals and ask that they be returned with their comments. These may be duplicated on one side with space provided for comments on opposite pages. A meeting of those persons who have reviewed the draft, including the chairman of the working groups, should be called to review these comments. Reviewing the complete draft serves to demonstrate to some committees the errors and omissions possible, and will stimulate them to aim for a more comprehensive and concise plan.

Estimating Numbers and Types of Spaces

Unless the architect is working with an unlimited budget he must arrive at some estimate of space and cost. He must be supplied with a list of spaces required. Two items of information are necessary to ascertain those spaces needed: (1) a statement of the educational program; (2) the number of pupils to be housed, including the ultimate enrollment and the number of pupils to be housed initially. Ultimate enrollment is needed if the school is to be built in stages.

Computing the enrollment for the conventional elementary school presents no problem. Determining the enrollment in programs of the secondary level is somewhat more difficult. Therefore, a basis is needed to estimate the enrollment for the particular curricular areas of the total program. The following process should prove helpful:

1. Select two or three high schools which have student bodies similar to the new school in regard to size, socio-economic background and educational objectives. Smaller districts may have fewer schools to use as samples.

2. Assemble enrollment data for one or more recent years available from these sample schools. This data must reflect the number enrolled in each course.

3. Take a total enrollment from all sample schools.

4. Compute the percentage of pupils taking each course in relation to the total number of pupils enrolled in the school.

5. Apply this percentage to the projected enrollment of the school being planned to get an estimated enrollment in each course.

6. Evaluate the results of the mathematical calculations in terms of how the present and future program of the new school will effect the projected enrollment. Present trends will have been considered in preparing the program statement. Judgment must be applied as to the reasonableness of the mathematical estimates.

7. Prepare a list of spaces based upon the projected enrollment. Desired class size and the periods or modules of time in the schedule must be applied to the projected enrollment.

To illustrate, take a hypothetical case:

1. "New High School" - planned for an ultimate capacity of 1800.

2. Select schools "A" and "B" as having an enrollment typical to that of "New High School".

3. The enrollment data indicates that the total enrollment of schools "A" and "B" was 3,000 during the last school year and that a total of 660 pupils took typing courses. Divide 3,000 into 660, giving 22% of the enrollment using the typing room.

4. Take 22% of 1800, and we obtain 400 pupils who can be expected to use the typing facilities in "New High School".

5. The program proposed teaching 40 pupils in each typing class. Divide the 400 by 40, giving 10 class sections using the typing room.

6. The schedule is to have six periods. Ten sections would require two typing rooms.

7. If the program statement indicates that the trend is for more pupils to take typing, and new proposals require that all pupils get at least one semester of personal typing, the estimate should be modified. A decision may be made to increase the capacity of each typing room to 45, which will permit 540 pupils to take typing at one time, using each room six periods. Or, a decision may be made that it is undesirable to make typing required but available as an elective. Two typing rooms may suffice at present and for the foreseeable future for this purpose.

The following forms may be helpful in gathering and organizing this data:

Projected Enrollment for "New High School"

Subject	Enrollment School "A"	 School "B"	Total	Divided by Total 3000	Projection for Enrollment of 1800
Typing	320	340	660	22%	400

Educational Requirements for "New High School"

Subject	Planned Membership	Desired Class Size	No. Class Sections	No. Periods in Schedule	Total Rooms Needed
Typing	400	40	10	6	2

The foregoing forms can facilitate making the computations which are necessary to determine the numbers of each type of facility needed in the new building. The architect will need to know that two typing rooms are necessary and that he can design the rooms and place them in the total scheme in accordance with the information presented in the program and facility description. The educational specifications should contain a schedule of the types of facilities and the number needed.

Some member of the educational staff should be responsible for gathering the information and computing the number of facilities which will be needed. The architect is not expected to do this. The final decisions on number should be reviewed and approved by the steering committee. The decisions concerning how the proposed program will modify the present enrollment factors will require a careful analysis by persons experienced in the field of education.

Interpreting the Educational Specifications

Someone with educational training and background should be responsible for working with the architect throughout the architectural planning stage. The architect may need explanations of educational processes which are foreign to his training and experience, or he may find some of the information incomplete. It is necessary that someone react to the architect's design solution as to whether it has solved the problems presented in the written document.

Rarely will the educational specifications provide all information and answer all questions concerning the educational requirements of the new plant. The steering committee can supply this service. The principal and his staff may do the work. Some districts have a building committee which reviews plans and recommends approval to the superintendent. This committee may serve a very essential administrative service but unless they are extremely well versed in instruction and familiar with the educational specifications, they will not fulfill the need to interpret educational needs and react to design solutions.

Length of Report

The primary purpose of educational specifications is to supply the required information to the architect concerning the number and types of spaces, the number of people who will use these facilities and their activities, and descriptions of the amount and types of equipment required in each area. This statement will be extensive, detailed and voluminous, but it is necessary in order to do the job adequately.

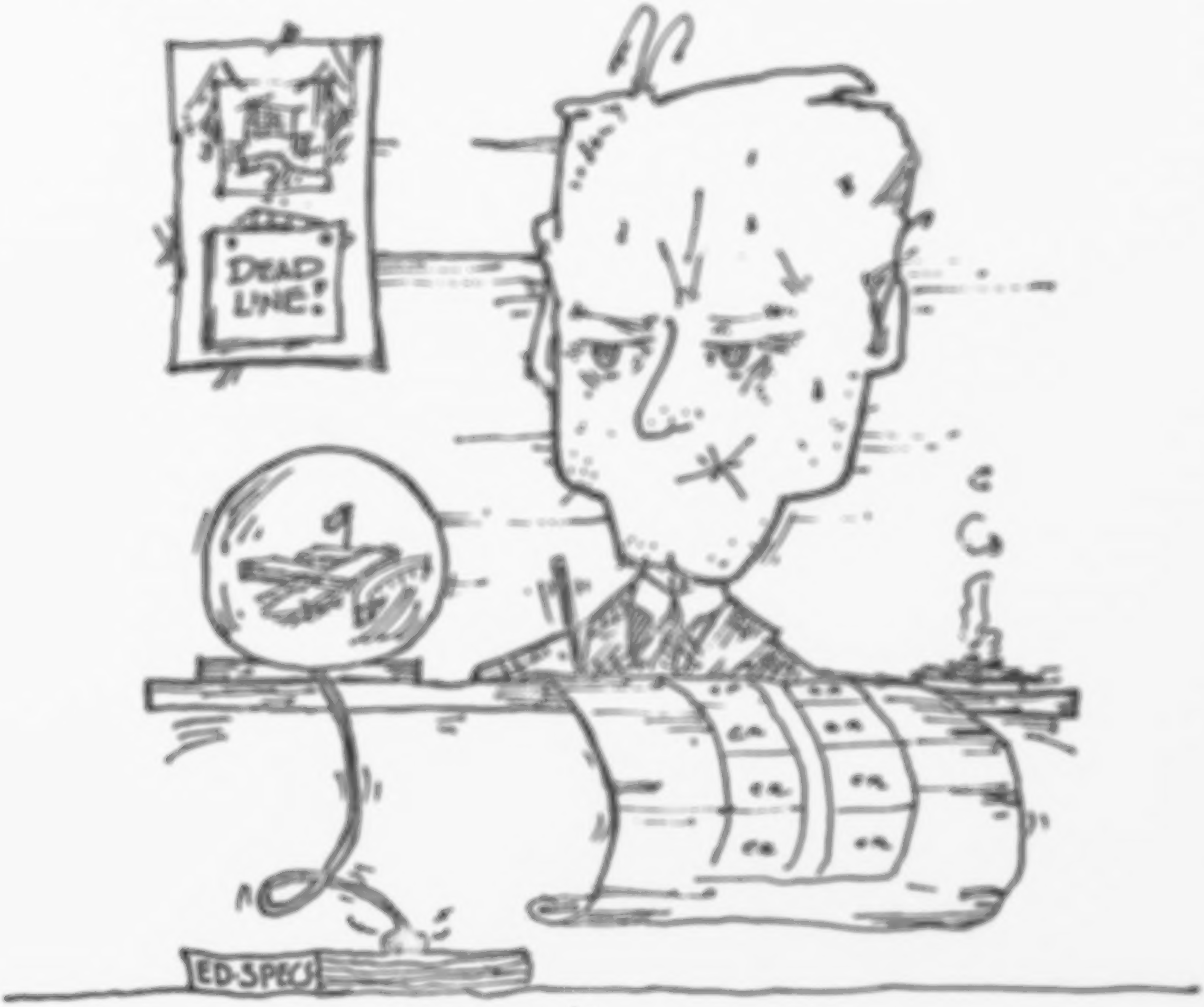
Other information may be considered in the planning process which should not be included in the written educational specifications. Keeping the content of the document to the bare essentials will make it more readily usable. Excess verbiage is unnecessary and tends to discourage the use of the document.

TIME REQUIRED

There is no single answer to the question of how much time is needed. This depends upon many things, such as size of project, experience of personnel in planning together, status of the curriculum, program development, number of people involved and the experience of the workers in writing educational specifications.

The amount of time available will depend upon the pressure of the demands for housing and the consideration that the county has given to planning in advance of need. It is generally agreed that an architect should be given a minimum of six months to a year to provide the drawings and specifications for a complete school plant. A like period should be allowed for preparing the educational specifications. A better job of planning could be done if each phase is allotted at least a year.

The status of curriculum development will determine the need for time. If the educational program is the result of continuous study of the pupil (his nature and needs), the research in various fields, and the trends regarding content and methods; the time needed to prepare educational specifications can be a minimum.



Budget Fitting

It is most desirable to establish an acceptable plan based on need. Having an acceptable plan, good public relations are desirable in order that the public will act favorably in providing funds for such plan. Good public relations are best established by allowing a layman or public representative to serve on committees and get a good understanding of what the educational plans are intended to do. It follows, that educational planning, other than being a plan for programming, is also a device to promote public approval. Public criticism of the program is limited when the actions of the working committees are open to public scrutiny and advice.

There is no practical method to prepare a detailed budget that would determine the amount of money available to each area of the school plant. Educational needs and money must be brought into perspective. It should be remembered that money is provided for need. If there is no need there is no need for funds.

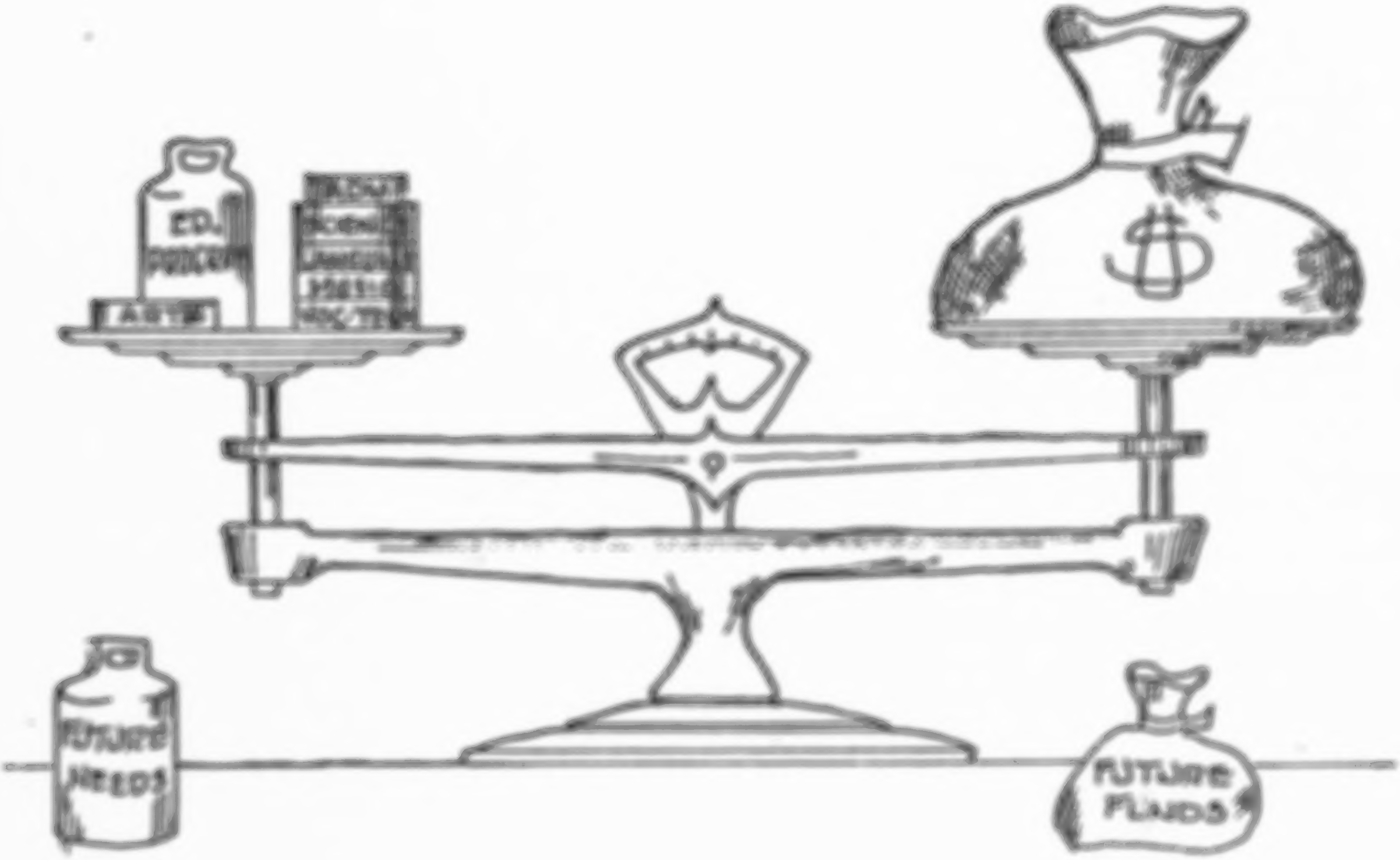
Plan the instructional program which is deemed desirable to meet the future needs of youth. The program must be practical to the extent that it can be implemented. If the program is carefully described, it will be easy to clearly illustrate the effect that reducing space will have on education.

Inevitably, balancing the budget against needs requires decisions. Suppose that the architect's estimate exceeds the budget; what can be done to bring needs and money into balance? (See Figure 8.)

From a negative viewpoint there are some undesirable methods too often practiced. One of these methods is best defined as the axe method. This method is either executed by persons in authority or by the architect as ordered. A part of the facility may be cut simply because removing its cost will bring the estimate within the budget. This method is hasty and arbitrary.

The girdle method may be equally as damaging to the instructional program. By this method, facilities are squeezed into the budget with the idea that the program can function in a tighter or smaller container.

Budget fitting must be a cooperative venture. The persons who prepare the educational specifications should have an opportunity to discuss priorities. The steering committee should function as a reactor panel to architectural solutions and changes made necessary by the budget. The solution may be between a reduction of space, using less expensive materials, or placing a particular facility in a future construction phase, or with another part of the plant serving more than one need. Possibly the budget should or could be increased for a particular project. The question should be asked: What changes can be made which will be least injurious to the instructional program? The answer to this question lies in setting up a guide to follow in fitting needs to budget.


ED.
ARTS
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FUTURE NEEDS
FUTURE FUNDS

Figure 8

Initiating Use of the Building

The staff which initially uses the building may not have been involved in the planning. It is important that the teachers, administrators, and service personnel be apprised of the reasoning behind the design of a new school plant. Too often this is not done and situations arise where a new plant is criticized by educators for failure to meet the needs of the program. Such criticism can be damaging to education and architecture if it is interpreted by the public as indicating incompetence or carelessness.

The written educational specifications can be used effectively to inform the new staff of the reasoning behind the planning. They can be used to provide a knowledge of the guiding philosophy and the educational program which was planned for this particular school. There is a natural reluctance to change the way we do things. The administration is justified in requiring that the staff of a new plant initiate the program for which the plant was planned. This should be a proviso for assignment to a new school. The program will change as the school progresses, therefore, the educational specifications become a reference point from which to move.

Copies of the educational specifications should be provided for new staff members and an in-service program planned for studying them. Upon occupancy of the building, educational specifications should be reviewed with the view to analyzing the intended use of the spaces and the purposes and functions for which they were intended.

Visiting New Plants

Words of caution must be stated about the visitation by educational planning committees to recently constructed schools in other school districts. Visitors can easily come away from a new plant with their thinking crystalized around an architectural design. Seeing new facilities and different instructional programs can inspire a planning group. The following suggestions may be appropriate:

Suggestions for Visitations

1. Ask questions about the instructional program. Ask what is taught, and why, if this is not apparent.
2. Find out what criteria is used for assigning pupils to the area and how many can be taught effectively and efficiently at one time.
3. Determine what purposes the equipment and furniture serve, if this is not evident.
4. Ask what activities are performed by teachers and pupils.
5. Look at the storage space which is provided and note the types and numbers of items which must be stored.

6. Note the design and size of the space, and the type of furniture and equipment.

7. Note types of material which have been used and the performance needs which prompted their use.

8. Study the program and facility comprehensively. Do not note just the unusual. Those things which you consider usual may not be the usual to your colleagues.

9. Write a comprehensive report when you return which may be duplicated and distributed to others who are working on instructional programs and facility planning.

10. Remember, you are interested in the facilities but you are also interested in why they were provided and how they are used.

11. If possible, take a camera, preferably a 35mm or a movie camera. Use color film. Movies or slides will provide a visual record of important items.

PLANNING FOR FUTURE EDUCATION

Trends in Education

Facilities planned today are for future instructional programs. Initial use will normally be at least three years after the educational planning, one year for architectural planning, one year for construction. Facilities are used from thirty years to an indefinite length of time. They must yield to changes as education evolves; or the children of future generations will be the losers.

Educators may be reluctant to prognosticate on where education may go. Architects ask for information on what future plans may be in order to design for changeability and to keep abreast with these needs.

Flexibility

The educational program is subject to constant revision. Teaching methods and administrative organizations change continuously. Our basic philosophy decrees that we direct the program planning to meet the needs of our pupils. We are told that the volume of knowledge available to us is multiplying at a tremendous rate. Technological developments have added to the complexity of planning through the introduction of new electronic and other types of equipment for use in teaching.

Three important factors emphasize the need for flexibility: (1) the population increase which has added so greatly to the number of pupils; (2) the knowledge explosion which has added new knowledge at an unprecedented rate; (3) the electronic devices which have been adapted to educational purposes. These have combined to give impetus to a search for better ways to utilize the staff, a re-evaluation of school organization, methods of presenting subject matter and for new and improved ways of adapting technological developments to education.

Team teaching, the use of educational and closed circuit television, teaching machines, and language laboratories are inovations of recent years. Some facilities of unusual size and shape have been designed to provide for programs adapted to utilize these inovations.

Educators should urge architects to use every means possible, within the limits of practicality, to provide for present and future flexibility in the school plant. This can be done in several ways, such as: (1) providing flexibility in order to change the sizes and shapes of spaces; (2) designing spaces to serve more than one purpose; (3) planning for future expansion in all locations where it is possible; (4) planning spaces of varying size to accommodate a variety of group sizes.

OUTLINE EDUCATIONAL SPECIFICATIONS

(720 Pupil Elementary School)

A. Educational Specifications Committee

B. Definitions of Terms and Abbreviations used in this Report

C. Philosophy

D. Community Use of School Facilities

E. Flexibility

F. Anticipated Changes in the Instructional Program

G. Climate Control

H. Communications

    1. Telephones

    2. Inter-Com/Public Address System

    3. Clock-Bell System

I. Plumbing

J. Sound Control

K. Floors

    1. Outside Floors

    2. Inside Floors

L. Ceiling and Roof

M. Vandalism

N. Lighting

O. Standardization

P. Schedule of Plant Completion

Q. Site Planning

R. Maintenance Facilities and Operations

S. Administrative and Special Service Areas

   1. Administrative Suite
   2. Multi-Service Area
   3. Special Education Resource Area
   4. Production Area
   5. Instructional Supply Area
   6. Teachers' Lounge

T. Cafetorium and Kitchen

   1. School Lunch Program
   2. Dining Area
   3. Stage
   4. Kitchen

U. Materials Center

   1. Main Reading Room
   2. Professional Library
   3. Workroom
   4. Librarian's Office
   5. Audio-visual Storage Area
   6. Space Relations of Materials Center

V. Classrooms

   1. Indoor Teaching Areas
   2. Outdoor Teaching Areas
   3. Primary Teaching Areas
   4. Intermediate Teaching Area

W. Comparison of Scales for Estimating Minimum Space Requirements

X. Staff Planning

Y. Personnel

  1. County

  2. State Department of Education

  3. Elementary Steering Committee

* BASIC EDUCATIONAL SPECIFICATIONS

FOR A DATA PROCESSING TECHNOLOGY DEPARTMENT

I. Purpose for Which This Facility Will be Used

A. Preparatory and supplementary training in Data Processing Technology in a Vocational-Technical Center will be concerned with the use and operation of electronic computing equipment and the implementation of designed programming, processing, and interpretation of data.

Electronic Data Processing is the use of electronic computers and related equipment for processing large masses of business and scientific data.

In service organizations the EDP machines are used for such activities as payroll, personnel and other accounting inventory control and billing. In manufacturing companies, computing systems are used for such functions as sales forecasting, requirements determination, inventory management, production scheduling and control, materials handling, and product distribution.

In 1963 there were fewer than one million people directly involved with electronic data processing, and the National Science Teachers Association predicts that in 1970 there will be about three million.

In the study of technical education for occupations in the field of data processing made by the U. S. Office of Education, it was recognized early that training must be provided for two distinct areas: (1) business data processing, and (2) scientific and engineering applications. Although electronic computers are used for other purposes, as in the numerical control of machines, processes, and other manufacturing operations, training for occupations in this field of work is not presently anticipated in this vocational-technical center.

Both scientific and business data processing should be considered, and with business data processing curriculum already in existence, it can be expanded to include a scientific curriculum. To do so, additional courses stressing mathematics and science are essential, and the emphasis must be on scientific applications. It is essential to both programs that computer and data processing equipment be available for student use. The present curriculum is concerned only with BUSINESS data processing.

The student who receives this training will not only learn to be a "Machine Operator" and/or a "Computer Programmer", but will have the basic foundation to enter such advanced training for areas as "Systems Analyst" and "Project Planner". In fact, this background provides many opportunities in this fast-growing industry.

The purposes and philosophy of the Data Processing Technology Department of this Vocational-Technical Center are:

1. To train for successful employment in one of the various levels of work with punched-card equipment and computer systems.

2. To help the student evaluate his interests and aptitudes and to correlate them with job requirements and job opportunities.

3. To help each student realize his full potential and to direct his activities toward being a useful, productive citizen.

4. To maintain a laboratory atmosphere conducive to concentration on endeavors and realization of ambitions.

5. To keep students aware of the rapid changes in Data Processing Technology by presenting new information as efficiently and effectively as available media permits.

6. To work with the Data Processing leaders in the community to attain realistic standards of production and to keep abreast of changing demands of employment, and

7. To develop healthy attitudes toward work and point the way to happiness in employment and joy in honest and fruitful labor.

B. Class Groups Which This Instructional Space Will Need to Serve

This training facility will be able to serve five different groups (or classes) of students. By providing additional instructors and classrooms, the groups can be increased, utilizing the same laboratory equipment.

This training facility will be utilized for:

1. Two 3-hour sessions in the morning
2. Three 3-hour sessions in the afternoon
3. One 4-hour session in the late afternoon
4. One part-time 3-hour supplementary group Monday and Wednesday evenings
5. One part-time 3-hour supplementary group Tuesday and Thursday evenings

C. Teacher-Pupil Ratio

The teacher-pupil ratio shall not be over 20 students to a teacher in advanced training such as Computer Programming, the ratio should not be over 15 students to a teacher.

*This is an excerpt from an educational specification developed for a specific school and is not a recommendation but an example of the detail included in some final specifications.

II. The Instructional Program

A. The General Plan by Which the Instruction Will be Carried On

The general plan by which the instruction will be carried on should be considered in three divisions: Key Punch Operator Trainees; Unit Record Machine Programmer Trainees; and (second year students) Computer Programmer Trainees.

Every effort is made to give the student a solid basic foundation in his chosen field and he is encouraged to develop to his fullest potential

1. Key Punch Operator Trainees

There is group participation whenever possible, and on individual basis whenever necessary. Students may enroll in the class whenever there are available machines. Depending upon individual progress and withdrawals, machines become available at various times. Individual instruction is more frequent than class instruction in this course.

Actual theory instruction can be accomplished in 10 hours of class work, and the student progresses at his own rate in supervised skill development for approximately 170 hours. Individual scheduling of hours can be from two to six hours per day.

2. Unit Record Machine Programmer Trainees

This course is the first of a two-year course for Computer Programmers, but is divided into units or blocks so that an individual taking the first year should be employable as a Unit Record Machine Programmer if he could not complete both years of study. At the conclusion of the first year, the trainee is qualified to obtain employment as a Machine Operator or Machine Operator Trainee with potential for more rapid advancement than those who have not had the course.

The instruction includes explanation and demonstration of the use, purpose and operation of each machine; how it is programmed to perform its various operations; its relationship to the function of other Unit Record Machines. Students complete assigned practical exercises in programming the machines, using punched and unpunched cards, control panels they have wired themselves, and turn in a finished product in the form of a printed report and/or punched cards. Exercises are given for experience in working with large volumes of cards. As soon as possible, without confusing the students, several machines are introduced so that a number of machines can be in use at the same time, providing maximum use of machines and a minimum of waiting time for the students.

About 60% of the instruction will be devoted to classroom work and 40% will be done in the laboratory. The classroom work is directly related to the laboratory work for better student understanding.

3. Computer Programmers (Second year students)

These students continue to use the Unit Record equipment in addition to using the computer. There is class discussion in the beginning of the course, and then spasmodically throughout the course, as new concepts are introduced. The majority of the student's time in this course is spent in lengthy periods of individual work.

B. Objectives and Content of Preparatory Classes

1. Key Punch Operator Trainees

a. To provide opportunities for development of employable skill in key punch operation

b. To provide opportunities for, and requiring self-checking of, punched cards by use of the Verifiers

c. To promote healthy work attitudes and good work habits

d. To maintain an office-like atmosphere; providing routine assignments; requiring completion of work within time schedules; giving responsibility for maintaining card files and records; permitting normal distractions typical of key punch rooms, such as touring visitors observing work in progress.

e. To emphasize cooperation and consideration of the needs of others; providing a rotation schedule, but permitting flexibility according to need, and

f. To provide opportunities to observe the effects of correct and incorrect punching and card handling by providing limited-use assignments in operating (but not programming) other Unit Record equipment.

2. Unit Record Machine Programmer Trainees

a. to provide opportunities for wiring control panels and operating the various machines in the laboratory

b. To study the functional wiring principles and the purposes of Unit Record equipment in prevalent use but not available in our laboratory.

c. To emphasize the need for good housekeeping so that materials and equipment accessories are readily accessible to all operators.

d. To provide experience in reading and developing block diagrams and flow charts

e. To present problems to be solved, requiring analytical reasoning based on knowledge of the functions of the control panels

f. To give opportunities for self-expression and communication through speaking before the class to discuss items of particular interest with the class.

g. To permit students to conduct visitors on tours of the installation

h. To encourage neatness in diagrams, flow charts, all written and printed work, as well as work areas

i. To encourage those who exhibit exceptional reasoning ability and who progress adequately in mathematics, accounting, and machine operation to continue their study into Computer Programming the following year

j. To encourage those who find control panel wiring difficult to concentrate on the operation of the machines and in following directions quickly and efficiently, and

k. To assist in placing in employment those students who have obtained an employable skill.

2. Computer Programmer Trainees

a. To provide the student with sufficient knowledge of programming concepts so that he may program any specific EDP system with a minimum of instruction.

b. To study the functions and capabilities of the 1620 Computer and become familiar with some of the tools and raw materials necessary for becoming a programmer. He will perform programming drills, exercises, and case studies which will serve to bridge the gap from the theoretical to the real world of data processing.

c. To provide opportunities to analyze, evaluate, and make modifications to operational computer programs. Individual phases of certain selected systems are studied in detail in order that the student may learn advanced programming and logic decision techniques as applied in sophisticated systems.

d. To provide the student with an insight into the various functions of advanced programming systems and the manner in which they perform without learning the actual programming language of the various systems, and

e. To acquaint the student with the theory of statistics and its application in business today. The student will gain an understanding of the kinds of regularity that exist among random fluctuations. He will obtain experience in associating and using mathematical models to interpret physical phenomena and predicting, with reasonable certainty, the outcomes of experiments related to practical business problems. Methods of organizing and presenting data with intelligent interpretations are emphasized throughout the course.

C. Objectives of Part-Time Supplementary Classes

The instructional program for part-time supplementary courses is dependent upon the specific needs of a group of students. A course may be offered in any one of the many phases of the program. The content of any course offered would be tailored to the needs of the technician who is presently working in this occupation, or to the needs of the currently employed office worker who forsees the need for re-training.

D. Activities Which Will Take Place in This Facility

1. Preparatory Courses

a. Activities of the Teacher

(1) Key Punch Classes:

Teacher activities here are very similar to those in most other instruction. The normal preparation for instruction includes preparation of assignment sheets and progress records, setting up visual aid equipment for skill development, and a review of the annotated records of the previous day's work -- these are normal preparations.

(2) Unit Record Machine Programmer Classes:

Preparation of teaching aids for this class is perhaps the most time-consuming activity of the teacher. New approaches to the instruction problems must be found to meet the needs of the groups with varying degrees of maturity and real-life business experience.

Paper work is voluminous - writing tests within the scope of the group's experience, filing and finding appropriate material previously used, preparing new assignments, grading papers, recording grades, attendance reports.

The teacher is responsible for seeing that students observe good housekeeping practices, such as tearing down completed panels and putting away wires and panels;

filing completed work; filing materials used in the projects; and making proper identification of all work and material.

(3) Computer Programmer Classes:

Individualized instruction for this group consumes much of the teacher's time. In preparation for the class, the teacher must study a student's program to detect the line of reasoning the student is using in writing the program. Constant reading of new material is essential for the Computer Programmer teacher - keeping abreast of the new developments in computers, knowing what other schools are doing. Study is required to organize the work to present to the class when new problems are to be undertaken.

It is the duty of the teacher to maintain a helpful, courteous, friendly, cheerful, and cooperative atmosphere in the classroom and laboratory. Careful teacher preparation is the keynote.

To strive to have each student reach his full potential means that the teacher must consider each student as an individual with his own peculiar problems whose human dignity must be respected. The teacher must put forth maximum effort to inspire students to work at their peak capacity and to stimulate curiosity for learning.

Providing for individual differences is perhaps the greatest challenge to the teacher. Data Processing, in any of its phases, opens up a new way of thinking for most students. New and strange ideas are presented; fascinating codes are to be learned; each functional wiring principle opens up myriads of applications. Because it is new and strange, the teacher must constantly be on guard against misconceptions the students may have. Care must be taken to see that each student thoroughly understands each principle before others are added to complicate matters. This checking can be done through testing and through laboratory projects, but it must also be done by the individual student's oral explanation to the teacher. In this way, the communication skills are integrated into the subject.

Visual aids play a vital part. Chalkboards, panel diagrams, projected schematics or diagrams, manuals and other reference works, as well as hand-out sheets are utilized almost daily.

Because of the amount to be learned, each principle being built upon knowledge of the one preceding it, progress must be made with all deliberate speed.

Thorough and complete understanding of each principle must be reinforced with actual practice in the performance of completing projects, using the laboratory equipment for repeated applications of the principles involved.

Underlying all teaching activities in the Data Processing Technology is the teacher's desire to:

(1) Keep abreast of the rapidly changing equipment

(2) Develop the ability of students to follow instructions and the responsibility to carry them out

(3) Develop good work attitudes and habits

(4) Develop an awareness of the importance of good personal grooming

(5) Provide an understanding of how and why people react as they do to oral suggestions or directions.

(6) Develop the students' ability to communicate effectively - with machines and with people

(7) Instill the values of good human relations and the need for working cooperatively, accepting criticism gracefully, being courteous and enthusiastic in the work, and

(8) Maintaining friendly relationships.

b. Activities of the Students

(1) Key Punch Students:

(a) In getting ready for class, keypunch students need to do outside class study during the first ten hours, with only occassional homework after that. In preparation for class they need to: hang wraps, have a pencil, read the bulletin board, get a supply of blank cards and their source data.

(b) During class, they work on exercises under timed conditions to increase their speed and accuracy. They are supervised, time-tested, corrected in techniques, and instructed in procedures for new work. They work at individual speeds, verify their own work and the work of others using the verifiers, and record their own achievement on progress charts. They file the cards they have punched and verified. They are counseled, advised, and encouraged, and when they are ready to go to work, they are assisted in finding employment.

(2) Unit Record Machine Programming Students:

(a) In getting ready for class, these students complete homework assignments that have required a minimum of materials. Their materials are bulky and difficult to pack to take home each evening.

(b) During class and lab periods, the student needs to have all project materials in one convenient location within reach of wherever he is working. These include: Textbooks, manuals, diagram pads, decks of punched cards, workbooks, colored pens or pencils, templates, notebooks, hand-out materials, schematics, and completed diagrams. These materials are needed in the classroom and in the lab. In addition to that, while in the lab, he must have access to panels, wires, forms, cards, displayed diagrams, machines, and a place to file his completed work for grading.

(3) Computer Programming Students:

(a) In getting ready for class these students have homework assignments that are continuations of classwork. They have many outside reading assignments in current magazines, new books, and in their textbook.

(b) During class, Computer Programmers spend most of their time in concentrating on working out individual problems and must have a quiet room. Large work tables with removable enclosures should be made to provide an atmosphere conducive to concentration, eliminating distracting influences. Enclosed tables should be large enough for spreading out the materials which include flow charts (11" x 17"), programming sheets, manuals, textbooks, assignment sheets, and cards in trays.

Access to the computer or to a dispatch area for a computer operator to test the Programs is essential, as well as the use of an interpreting keypunch as needed

Although there is some lecture in this course, the majority of the time is spent in student participation in the development of computer programs, assisted individually by the instructor. After the program is written, keypunched, and tested on the computer, the individual student must be assisted by the instructor in locating errors in his program. The use of live projects is encouraged only as they directly apply to the instructional program. The projects can be obtained by assisting the county office in handling some of their work by data processing methods. This type of project will need to be planned carefully to fulfill the needs of the instructional program rather than developing into a production operation with the students' needs receiving secondary consideration.

2. Supplementary Courses

a. Activities of Teachers

The specific needs of the class members will need to be carefully studied and classes formed only when there is a homogeneous group of sufficient size to begin a class. Determining the course content to fit the needs of all students who are accepted in the class will be the biggest job facing the teacher. Teaching aids already in use in the full-time day classes may be used for the evening classes or additional ones prepared.

b. Activities of Students

A portion of the student time should be spent in the classroom dwelling upon theory, but whether the students are employed machine operators or employed office workers, it will be necessary that they be given an opportunity to test the problems they work, by wiring the panels and operating the machines. The employed office workers who seek retraining in data processing will need more laboratory time and class instruction time than students who are currently working in a data processing installation.

III. Facilities Needed

A. Identification of Areas of Space Needed

The areas of space needed in this facility are:

1. Unit Record Machine Room
2. Key Punch and Typing Speed Development Room

3. Computer Laboratory
4. Computer Programming Area (isolated and very quiet)
5. Unit Record Machine Theory Classroom
6. Conference Room and Staff Office
7. Related Studies Instructional Area for Accounting, Data Processing Math, Communications, Economics, etc.
8. Dehumidified Storage Room and Locked Files of Records, etc.
9. Rest Rooms
10. Lockers for students, and
11. Storage for Customer Engineer test equipment.

B. Description, Approximate Size and the Major Items of Equipment and/or Space

Identified in "A" above

1. Unit Record Machine Room

Approximately 900 sq. ft. to serve 20 students

a. Machines as follows:

Number and Name of Machine	Space Needed During Operation	Space Needed While Being Serviced
(1) 402 Accounting Machine	65" x 43"	115" x 115"
(2) 519 Reproducer	53" x 25"	101" x 75"
(3) 085 Collator	43" x 20"	91" x 77"
(4) 082 Sorter	61" x 16"	93" x 52"
(5) 548 Interpreter	40" x 25"	88" x 73"

b. Wiring Station Units

(1) One 25" x 12' slanted 30" high in front to 42" high in back

(2) One 25" x 18' slanted 30" high in front to 42" high in back

(3) One 25" x 15' slanted 30" high in front to 42" high in back

(4) Two corner stations, 3' across the front, 5' across the back, 25" wide slanted 30" high in front to 42" high in back

c. 17 Swinging Stools at the wiring stations

d. Work Table, 72" x 24", with four chairs

e. Work Truck on casters, 2' x 3'

f. Control Panel Cabinets (9' x 3')

    (1) 40 - 402 Accounting Machine Panels

    (2) 60 - Panels to be used interchangeably with the Reproducer and Collator

    (3) 40 - 548 Interpreter Panels

g. Wiring bin, 3' x 3' located near control panel cabinets

h. Much passage space within the area for students to move about between wiring stations and machines

i. 3 Chairs for work tables

j. One built-in work counter, 2' x 26', with two shelves the full length and depth. Counter to be built along wall adjacent to classroom and having rounded corner near the door.

k. Electrical outlets for 5 machines, preferably not all on same circuit. Electrical requirements are listed on separate sheet.

l. School bell to be located within this room because of abnormal noise of the machines

2. Key Punch Room

Approximately 405 sq. ft. to serve 20 students

a. 21 Posture chairs
b. 3 Verifiers with pedestal desks and waste baskets
c. 7 Key Punches with pedestal desks and waste baskets
d. 10 Typing tables
e. 10 Selectric Simulator typewriters
f. 21 Electrical outlets
g. 5 Small waste baskets
h. 1 Huge waste basket
i. 1 Teacher desk
j. 1 Projector and table
k. 1 Tape recorder
l. 1 - 15' Wall completely blank and of smooth surface to be used as a projector screen
m. 1 - 20 drawer card file

Walls and ceiling must be acoustically treated, and the floor carpeted. Electrical outlets for the key punch machines, typewriters, Skill Builder Projector, and the tape recorder must be provided. They should be controlled by a single switch which also controls the lights.

3. Computer Laboratory

Approximately 520 sq. ft. to serve 15 students

a. 1620 Computer, 119" x 123"

b. 1622 Card Read-Punch, 108" x 130"

c. 1443 Printer, 92" x 119"

d. 1311-3 Disk Drive, 96" x 50"

e. 3 Straight chairs

f. 1 Square table 36" x 36"

g. 1 Large waste basket

h. Electrical outlets as prescribed by IBM

i. Flooring, temperature control, acoustics, humidity are *prime factors* and *specified* by IBM

There should be at least one plate glass wall, since this room is the show place of the school.

The floor must be a free-access floor to the cables to the machines, having removable tile covered sections of flooring. Provisions must be made for expansion. (See No. 4 following)

The present equipment consists of the 1620 and the 1622. The 1620 is the Central Processing Unit, and the 1622 is the Card Read and Card Punch.

To meet our present needs we should also have the 1443 Printer and the 1311 Disk Storage Drive. These two items have already been requested from funds to be available after June 1965. We confidently anticipate favorable reaction to our request, and therefore include this equipment in our Educational Specifications for the new facility.

A number of items must be given careful consideration in providing the physical housing for the equipment: Flooring, power, weight, and service clearances.

A word about the double floors insofar as space is concerned: Computers have made such rapid strides in the last ten years, we would be quite foolish to anticipate that space to meet today's computer requirements will be sufficient for the computer requirements twenty years from now. It is very strongly recommended that serious consideration be given to an expanded Computer Laboratory and provide the appropriate flooring for the entire area, even though the little additional flooring is not immediately used for Computer components.

4. Computer Programming Area

Approximately 320 sq. ft. to serve 15 students

The floor, although not essentially of free-access design, should be double floored and of the same level as the computer room. Highly anticipated expansion suggests free-access flooring. The wall dividing the Programming Room from the Computer Lab should be a temporary one, yet eliminate noise going into the programming area.

This area should be as isolated and quiet as possible and completely free from distractions in the other areas of the department. It should have card file space and shelf space for a great many manuals. To isolate the programmers from each other, removable dividers should be placed on the tables. It must have a magnetic blackboard and a bulletin board and possibly a flannel board. Visual aids have been developed utilizing these magnetic blackboards and business and scientific organizations have started using them in their programming and planning departments because of the great flexibility in the modification of charts in the planning stages of an operation.

5. Unit Record Machine Theory Classroom

Approximately 891 sq. ft. to serve 24 students

This room should adjoin the Unit Record Machine Room and have large "see-thru" windows between. There should be a passageway of a minimum of five feet between the Machine Room and the Theory Classroom to permit rolling a machine into the classroom for demonstration and lecture.

a. Overhead projector, with table and electrical outlet near the rear of the room

b. Storage closet for posters, visual aids, and other teaching aids

c. Four built-in 3-track diagram storage and display cabinets for diagrams 4' x 8'

d. Of the twelve possible display areas created by above, one of them should be completely blank for use in projecting diagrams in sizes large enough to be read anywhere in the room (4' x 8'); four of them should be chalkboard; and the remaining displays would be for the schematics and diagrams of the various machines.

e. One set of two-way mirrors should be suspended from the ceiling over electrical outlet provided for demonstration machine. Mirrors reflect the machine and the hands of the operator so that the details may be seen from any area in the classroom.

f. 15 large tables with slides underneath at ends of tables to receive drawer-like book baskets.

g. 20 straight chairs

h. One teacher desk

i. Bulletin boards and chalkboards wherever space permits

j. One waste basket

k. One electrical outlet for machine to be rolled in - no other outlets on this circuit

l. One 4-drawer letter file

m. Two bookcases for reference library

n. One tape recorder with table and electrical outlet near the front of the room, close to teacher desk

o. 30 book baskets, each 12" long, 18" wide, 4-3/8" deep

6. Conference Room and Staff Office

Approximately 120 sq. ft. to serve three instructors

Located in the very center of the activity of this department, the office space is to be used for housing teaching materials and records and reports. It will be used primarily for a work area, not a vigilance spot, although some glass windows are requested.

This is a two-teacher Data Processing office for one year and a three or four-teacher office shortly thereafter. Facilities for storage of related instructional materials should be provided and office space for the related subjects teachers.

The telephone is housed here, and because of the noise of the machines, the bell must be made to ring via a buzzer and/or flasher in each area of the department. A view of the telephone from outside the office is a requirement.

In view of the anticipated number of teachers to use this space, 12' x 14' is not an unreasonable request for space.

a. Three desks (one corner desk)
b. Three chairs
c. Shelves along the 4' wall

7. Related Instructional Area

Approximately 484 sq. ft. to serve 20 students

Related studies consume one-half the student's time and are to be taught within the walls of the department. Observe in Section D, which follows, that 154 square feet have been reserved for this area from the allotted 3500 square feet for the department. The location of the Related Instructional Area is shown on the floor plan. A minimum of an additional 330 square feet is needed to make this room 22 x 22 (484 sq. ft.), which is barely large enough. However, since all the other areas are designated as minimum, we cannot sacrifice space elsewhere in this department to enlarge this area.

This room is to be equipped for accounting, communications, mathematics, statistics, economics, etc. It should have:

a. Ten large tables with runners under the ends of tables for book baskets

b. Desk calculator

c. Adding machine

d. Tape recorder

e. Opaque projector

f. Projector screen

g. Storage closet

h. Every inch of chalkboard and bulletin board space available provided

i. 21 chairs

j. Teacher desk

k. One bookcase

l. One 4-drawer letter file

m. 20 book baskets

8. Dehumidified Storage

Approximately 80 sq. ft. to store cards, punched and unpunched

Due to the nature of the storage in this area a moisture control of 30-65 percent is necessary; therefore, a dehumidifier should be installed which can be set to automatically control the humidity.

Card file cabinets and card box files should be placed along one wall and adjustable shelves two feet wide on the opposite wall. The door is to be locked for safe keeping of specific materials such as county office EDP projects.

9. Toilets

Control of students in the department can be better maintained if the department has its own toilet facilities, and due to the nature of the amount of expensive equipment, a strict control needs to be maintained. Restrooms should contain standard equipment.

a. One men's toilet to serve approximately 30 students
b. One women's toilet to serve approximately 30 students

10. Lockers

Locker facilities for 60 students should be provided within the department. They should be designed for storage and removal of plastic bookbaskets.

Height: 4-3/8"
Width: 12"
Depth: 18"

Lockers should be equipped to accept padlocks.

11. Customer Engineer Storage

Approximately 28 sq. ft.

a. Adjustable shelves provided along back wall
b. One desk
c. One chair

C. Special Facility Considerations

1. All areas within the department must be accessible from a hall or passageway.

2. The entire department is to be locked from a single entrance.

3. The office and machine areas are to be locked by one door separating them from the other areas in the department.

4. The noisy areas are to be concentrated in one location with particular attention to acoustical treatment. These are machine areas, and since machines generate heat, there must be adequate control of the air conditioning and heat.

5. Quiet areas should be well protected from the nearby noises by thickness and acoustical treatment of walls and ceilings. The Programming Room should be secluded to eliminate all distractions of traffic.

6. Students are to have access to their lockers and project storage facilities, to restrooms and drinking fountain without having to leave the department door.

7. All electrical outlets to be controlled by one bank of switches located in or near the office. The electricity to the computer is not to be turned off, however, and should be on a separate line as indicated by specific directions from IBM.

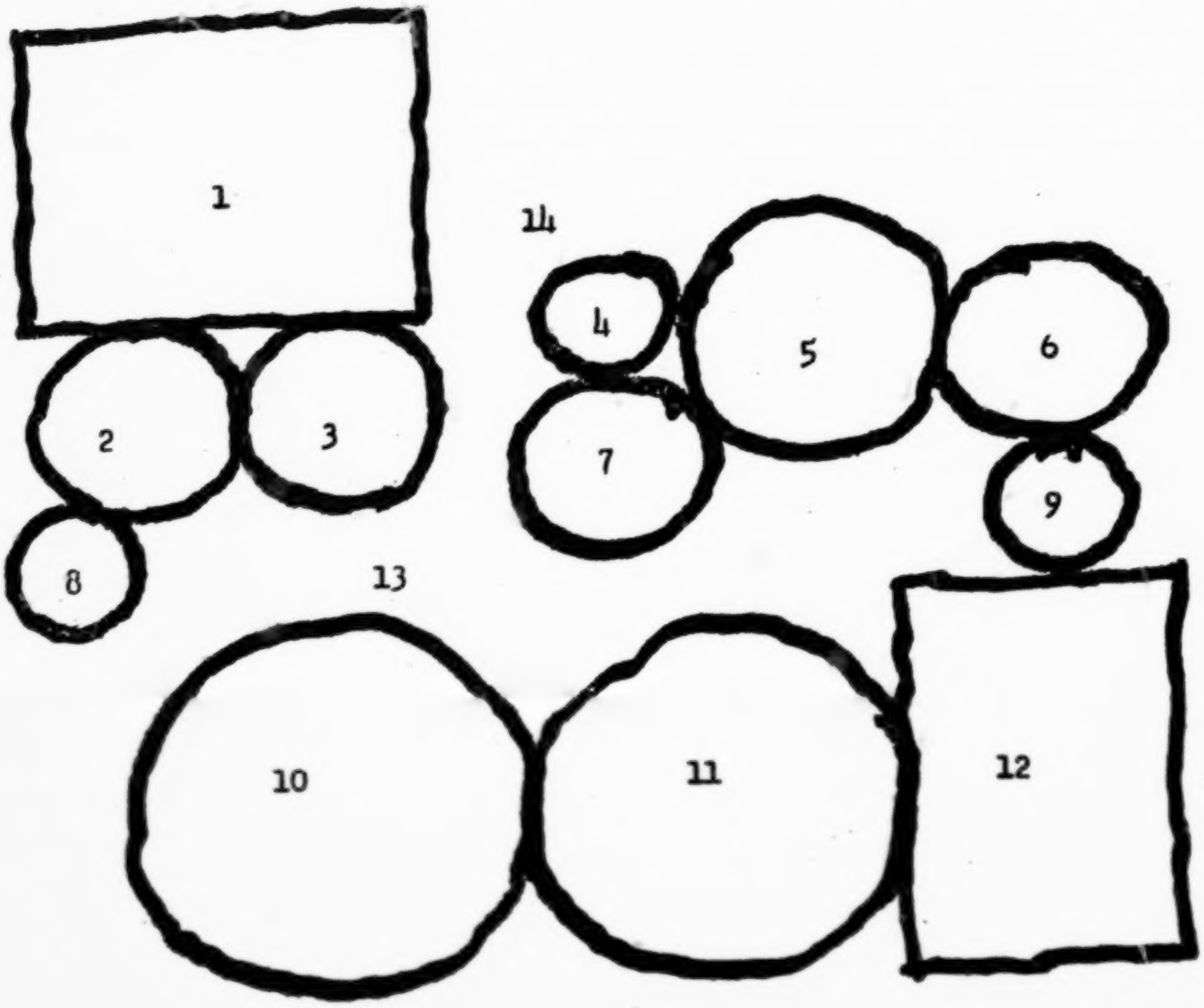
8. Floor-to-ceiling room dividers may be used instead of walls. Load-bearing walls should be kept to a minimum. Rapid expansion in this department is anticipated, and provisions for expansion should be considered in the types of walls used.

9. Consideration should be given to the location of windows on the outside walls so that available display space is kept to a maximum. Windows could be ABOVE or BELOW chalkboard height.

10. An emergency exit is necessary. Its location at the end of the row of Unit Record machines is ideal.

11. Free access to all areas is provided in the attached floor plan except for the special storage (which is not to be available to anyone but teachers). No wall separates the Machine Room from the hall, giving more space in Machine Room during lab periods and providing passageway for all students at end of class time. Placing card files in the passageway provides for access to them from all areas. The files define the actual passageway as there will not be a wall separating the hall from the machine room.

12. Bells or buzzers and flashers - Bells for schedule changes should ring in each room, including restrooms, with louder bells or flashers in keypunch, machine and computer rooms. Telephone buzzers should ring in each room.



D. Diagram of relationship of areas or spaces identified above.

1. Related Instructional Area
2. Boys' Rest Room
3. Girls' Rest Room
4. Special Storage
5. Programming
6. Computer Laboratory
7. Staff office and conference room
8. Storage from classroom for visual aids; from hallway for janitorial supplies
9. Customer Engineer test equipment storage
10. Unit Record Theory Classroom
11. Unit Record Machine Room
12. Key Punch Room
13. Hall and passageways
14. Entrance

IV. Relationships in School Plant and Site Planning

A. Relationship of this shop to other offerings in the school

The Business Education Department and the Data Processing Department should be located in close proximity. The interests of the two groups of students are similar and many of the Data Processing students (particularly the Key Punch Trainees) come from the Business Education Department. It should also be located close to the administrative offices. The facilities of this laboratory will possibly be used in scheduling, grading, and other student reporting.

B. Relationship of this department to the school site ground floor facilities are particularly advisable; the weight of the machines would otherwise require special attention; the delivery of cards, machines, supplies, etc. is facilitated by the ground floor location. Expansion is anticipated; therefore, the department should be located at the end of the building.

* SITE PLANNING

I. Buses

A. A turning radius of 120 feet should be provided (outside wheel turning radius) at all future schools for entrance and exit of school buses to loading and unloading areas.

Length of bus	35 feet
Height of bus	12 feet
Width of bus	8 feet

B. Provide an overhang at loading stations of the following dimensions: at least 120 feet long, 14 feet high, and 8 feet wide. This will protect pupils in inclement weather. The number of buses serving a school depends upon the community area to be served by the school and should be determined in advance by a survey of the proposed attendance area.

C. Provide separate parking areas away from bus loading zone for vehicles of pupils, regular staff members, and parents.

D. Commercial vehicles delivering supplies to schools need separate facilities apart from the bus loading area to reduce the possibility of accidents.

II. Parking

Parking spaces should be provided in a main parking area that will accommodate automobiles for teachers and supporting staff, plus visitors and parents. It is recommended that the area be designed to minimize backing of vehicles. The area should be provided with adequate lighting for night functions. It should be marked for individual spaces and have directional signs to direct one way traffic. The entrance to the parking area should be wide enough to permit safe passage of children if they should have to enter the plant through this area, in which case, provide a pedestrian pathway around or through the parking area.

Space should be provided for pupils' bicycle parking in adequate amount to permit an even flow of traffic. Bicycle parking areas should be located in a protected position so that riders will not be exposed to direct streams of traffic, parked autos and school buses.

III. Service Drives

These areas should be planned so as to permit safe and quick deliveries with no reverse driving. Dock space should be provided to permit easy loading and

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*This is an excerpt from an educational specification developed for a specific school and is not a recommendation but an example of the detail included in some final specifications.

Service Drives (continued)

unloading. Provide rubber wheeled dollies.

IV. Physical Education

It is fairly well established and accepted by educators that the physical education program seeks these goals:

- A. To develop physical growth.
- B. To develop good health.
- C. To develop muscular coordination.
- D. To develop desirable leisure time activities.

These goals may be applied to all phases of our educational program, especially to physical education. It is recommended that a school's physical education area should have a minimum of ten acres, exclusive of the school plant. Place one or two drinking fountains on each playground. A school site with adequate play area will provide space for the installation of suitable equipment and room for the placement of soft ball playing areas and similar team-type games. Space for hard surfaced courts should be planned. At least two courts measuring 90 feet by 100 feet are needed. These courts should be separated in order to avoid conflicting of play by several groups at the same time. Paved areas should be located far enough away from the building so that future plant additions will not infringe.

At least two softball diamonds with back stops should be included.

The area should be free of obstructions and covered with a good mat of wear resistant grass. Hazards of all types should be removed. Some type of shade or sheltered area should be available for the pupils' protection from sun or elements when temperature is high or rain interrupts the physical education period. The area should be well drained and usable in periods of wet and dry weather. A fence should separate the play area from any road or driveway that is through or adjacent to it. A toilet room is desirable for community use of the playground. This should be included in the planning and left for the community to provide at a later date.

It is further recommended that if exceptional children are included in the enrollment, a special play area be included for the handicapped children whose type of physical educational programs depart from the usual one.

Provide storage space for supplies: balls, bats, mats, nets, etc.

V. Site Development and Landscaping

School sites should be functional and beautiful to provide a pleasant setting for learning experiences. The foundation plantings, open area planting, and general landscaping should be carefully worked out by people who are thoroughly familiar with the soil, growing conditions, types of plants that serve a purpose and require little care. Charts and tables are available through agencies and state education agriculture departments. After the school has been in operation, it is often appropriate to consult with local nursery men, civic clubs, and parent groups in order to begin a planting program which may extend over a period of years. Refer to the publication Beautification and Landscaping by Community Groups and the section of this report on Community Use of School Facilities (page 8).

It is recommended that a natural area of flora be preserved and designated as such for inclusion in the school curriculm. A place of at least one-half acre should be preserved for this use. Here the teacher may guide pupils to observe plants, insects, trees, draw or sketch, listen to a story in a natural setting. This area is in addition to the individual outdoor science laboratory provided for each classroom. The one-half acre would be used by all pupils and the community.

VI. Space Relations

Sprinkler heads and pumps should be located in such a manner that would eliminate inconveniences of noise, water coming into windows or on walkways and in halls. Sprinklers should be recessed to prevent mowing crew from breaking them.

Keep music and noise producing activities away from class areas.

The assembly area should be located nearer to the parking area so that people need not walk through the entire plant when cafetorium is used by community groups.

The library and classroom areas should be conveniently near each other and away from noise of the physical education area.

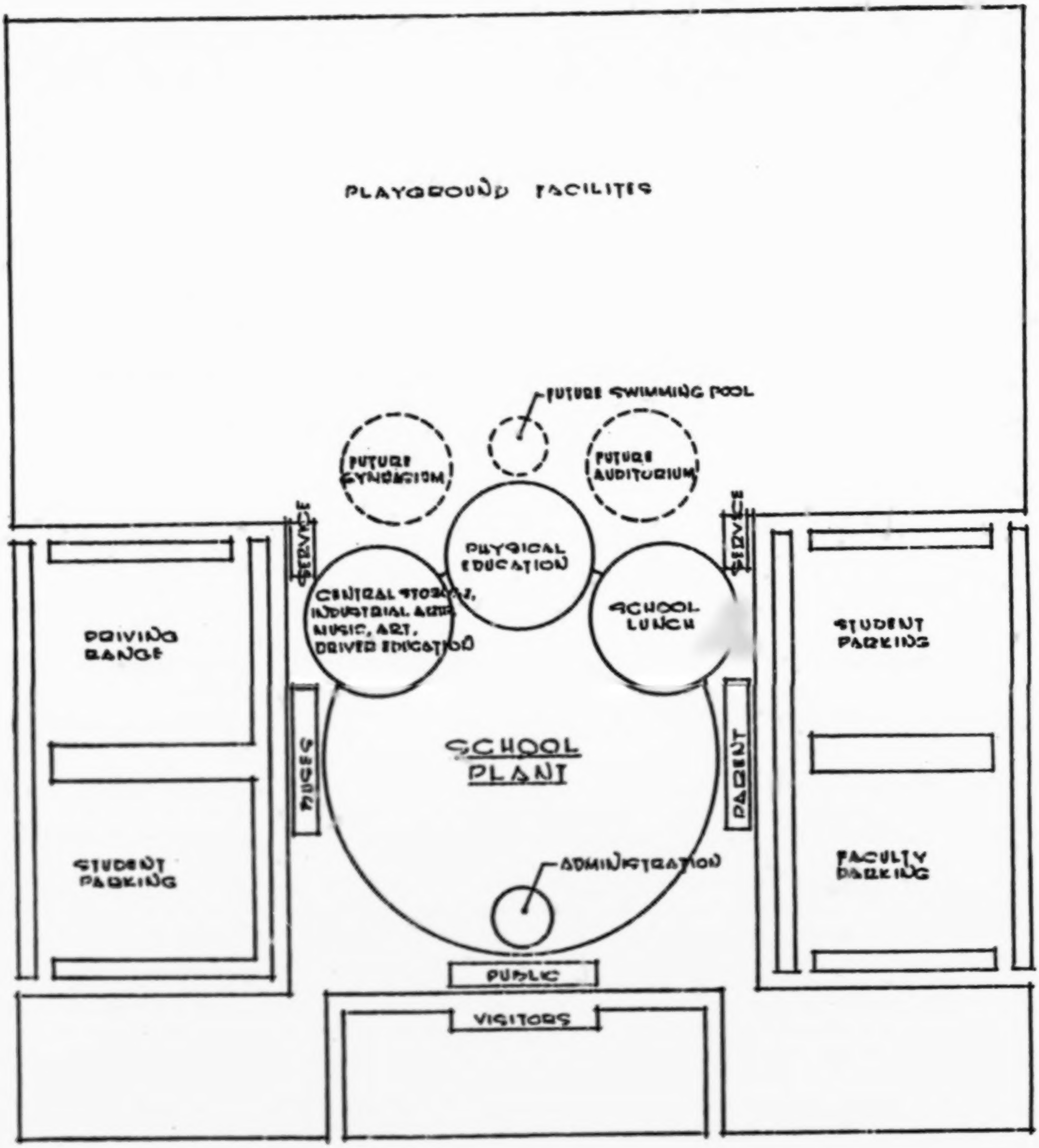
The incinerator should be located in a place that will not allow prevailing air movement to blow smoke and noxious odors into classrooms, cafetorium or office area.

Provide a well and pump of sufficient capacity to serve the entire site with a sprinkler system.

Provide space on the site where a raised platform may be added later to be lighted and used as an outdoor stage with audience of 1,000 seated on the grass and blacktops.

VII. Driver Training

The driving range should be located to keep noise and noxious fumes away from classrooms.


PLAYGROUND FACILITIES
FUTURE SWIMMING POOL
FUTURE GYMNASIUM
FUTURE AUDITORIUM
SERVICE
PHYSICAL EDUCATION
SERVICE
CENTRAL STORAGE, INDUSTRIAL ARTS, MUSIC, ART, DRIVER EDUCATION
SCHOOL LUNCH
DRIVING RANGE
STUDENT PARKING
BUSES
SCHOOL PLANT
PARENT
STUDENT PARKING
FACULTY PARKING
ADMINISTRATION
PUBLIC
VISITORS

SITE PLANNING

* BASIC EDUCATIONAL SPECIFICATIONS

MAINTENANCE AND OPERATION

FOR A JUNIOR-SENIOR HIGH SCHOOL

1. OBJECTIVES

The school facilities are provided for the purpose of housing the educational program. The maintenance and operations program is important in that these facilities must be kept clean and in good repair in order that the educational program be fulfilled. Proper maintenance and custodial care can prevent expensive repairs and therefore are factors in economy. Custodians are dedicated to this purpose.

2. DISCERNIBLE TRENDS

The educational program is continuously changing and improving by the introduction of new courses and educational services in the program to keep pace with the needs for a better education. In existing school plants, when the need of additional educational spaces are required, quite often the storage and custodial facilities have been converted to meet these needs. A maintenance and operations program that is to be successful must have the space, tools, equipment and personnel to accomplish its objectives.

3. PROGRAM

The maintenance and operation program involves the following:

A. General: The floors in the entire plant must be cleaned daily and most of this must be done after the day school is dismissed. All spaces occupied by adult education or special functions at night must be clean prior to opening of school the next day. Restrooms and clinics must be under constant care for cleaning and replenishing supplies. A daily mopping is required of the cafeteria and all restrooms. A schedule for dusting and cleaning of glass should be a part of the regular program.

B. Floor Waxing: A program that provides for scrubbing and waxing a few rooms daily works the best. This program should provide for waxing once a month during the school year.

C. Lawn Care: A complete lawn care program consisting of mowing, trimming, edging and watering the areas in the immediate vincinity of the building shall be provided.

*This is an excerpt from an educational specification developed for a specific school and is not a recommendation but an example of the detail included in some final specifications.

D. Maintenance: Minor maintenance will be performed by the custodians.

E. Staff: Present county staffing policy will provide a head custodian, 8 custodians and 2 maids.

4. ACTIVITIES

The duties and responsibilities of the custodians, in addition to the normal duties of cleaning and maintaining the school plant as outlined in the program, include operation of mechanical equipment, heating and air conditioning, opening and securing the plant for all functions and availability for emergency duty.

5. SPACE REQUIREMENTS

The minimum spaces required for a maintenance and operations program are: Central storage, yard tool storage, service closets, a head custodian's office and toilet facilities for custodians and matrons.

A. Storage Spaces

1. Central Storage: The bulk of all custodial supplies and extra furniture is stored in this space. This space should be centrally located in the school plant and on a service drive for convenient delivery of supplies. From this space small quantities, usually case lots, of custodial supplies are distributed to the service closet spaces which enables the prompt replenishment of expended items.

   (a) Shelving shall be provided for storage of custodial supplies.
   (b) Clear floor space for three 55 gallon drums in cradles.
   (c) A work bench should be provided for minor repairs. A locked tool cabinet should be provided.
   (d) A locked cabinet is required for security storage of small sanitary supplies.
   (e) Utilities should include three duplex convenience outlets, one being located over the workbench for use with powered hand tools.

2. Yard Tool Storage: This space should be detached from the main school plant because of a possible fire hazard due to storage of gasoline. Double doors are required to permit entrance of mower and wheelbarrow. Storage of all yard tools and equipment will be stored in this space.

3. Service Closets: Service closets should be provided for each pair of gang toilets and in the boys' and girls' physical education spaces. Space should be provided for one 24" x 48" dolly, two 20 gallon trash cans, one mop pail, shelving for one case of paper towels and one case of toilet paper, and a service sink immediately inside the door.

B. Custodians' Spaces

1. Head Custodian Office Space: Space is required for the head custodian to properly perform his duties and fulfill his responsibilities. Provide space for a single pedestal desk, one office chair, two visitor's chairs and one 4-drawer legal size filing cabinet. Utilities should include a phone, intercom speaker station, clock and two duplex convenience outlets. Locate adjacent to central storage.

2. Toilets: Provide separate spaces for custodians and matrons containing a water closet and lavatory, mirror, paper towel holder and toilet paper holder.

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